Socio-Economic Impact Assessment of the Provincial Government's Strategic Land Use Plans on Key Sectors in British Columbia

Final Report

October 31st, 2001

Presented to the Ministry of Sustainable Resource Management

Prepared by:

Pierce Lefebvre Consulting
3705 West 18th Ave.
Vancouver, B.C.
V6S 1B3
Tel: (604) 224-0648
Fax: (604) 224-5722
piercelef@telus.net

With Assistance from:

Stuart Gale and Associates
10818 Deep Cove Rd.
Sidney, B.C.
V8L 5M5
Tel: (250) 656-2024
Fax: (250) 656-2534
stuartgale@home.com

BriMar Consultants Ltd.
1078 Quailwood Pl.
Victoria, B.C.
V8X 4P2
Tel: (250) 658-1290
Fax: (250) 658-1220
brimar@pacificcoast.net

Socio-Economic Impact Assessment of the Provincial Government's Strategic Land Use Plans on Key Sectors in British Columbia

TABLE OF CONTENTS

EXECUTIVE SUMMARY I

1. INTRODUCTION 1
   - 1.1 Background and Purpose of this Study 1
   - 1.2 Approach and Methodology 2
   - 1.3 Report Outline 4

2. THE STRATEGIC LAND USE PLANNING PROCESS 5
   - 2.1 Rationale for SLUPs and Historical Highlights 5
   - 2.2 Overview of the Plans 7

3. IMPACT ASSESSMENT: INDUSTRIAL SECTORS 11
   - 3.1 Forest Industry 11
     - 3.1.1 Overview of the B.C. Forest Industry 11
     - 3.1.2 Base Case Assumptions 15
     - 3.1.3 Quantitative Data on Forest Industry SLUP Impacts 16
     - 3.1.4 Forest Industry Impacts Noted in the Socio-Economic Analyses for SLUPs 18
     - 3.1.5 Impact on Timber Harvesting Land Base 23
     - 3.1.6 B.C. Provincial Data on Total Productive Forest and Mature Forest Cover 25
     - 3.1.7 Impact Assessment of SLUPs on Key Indicators 31
     - 3.1.8 Summary and Conclusions 35
   - 3.2 Mining Industry 40
     - 3.2.1 Overview of the B.C. Mining Industry 40
     - 3.2.2 Base Case Assumptions 46
     - 3.2.3 Quantitative Data on Mining Industry SLUP Impacts 46
     - 3.2.4 Impact Assessment of SLUPs on Key Indicators 60
   - 3.3 Oil and Gas Industry 68
     - 3.3.1 Overview of the B.C. Oil and Gas Sector 68
     - 3.3.2 Base Case Assumptions 72
     - 3.3.3 Quantitative Data on Oil and Gas Sector SLUP Impacts 72
     - 3.3.4 Impact Assessment of SLUPs on Key Indicators 76
   - 3.4 Tourism/Recreation 80
     - 3.4.1 Overview of the Tourism Sector 80
     - 3.4.2 Overview of the B.C. Outdoor Recreation Sector 82
     - 3.4.3 Base Case Assumptions 84
     - 3.4.4 Quantitative Data on Tourism/Recreation SLUP Impacts 84
     - 3.4.5 Impact Assessment of SLUPs on Key Indicators 89
   - 3.5 Agriculture and Other Primary Industries 94
     - 3.5.1 SLUP Impacts on Agriculture 94
     - 3.5.2 SLUP Impacts on Other Primary Sectors 97

---

4. IMPACT ASSESSMENT: NON-INDUSTRIAL INTERESTS 99
4.1 Environmental Outcomes 99
4.1.1 Overview of Environmental Issues in B.C 99
4.1.2 SLUP Products That Affect Environmental Values 101
4.1.3 Impacts of SLUPs on Caribou and Grizzly Bear 108
4.1.4 Difficulties of Assessing Impacts of SLUPs on Environmental Values 109
4.1.5 Qualitative Insights into SLUP Impacts on Environmental Values 110
4.2 First Nations 113
4.3 Other Interests 115
4.3.1 Community and Other 116
4.3.2 Government Funding of Strategic Land Use Plans 117
5. SUMMARY AND CONCLUSIONS 119

List of Tables

Summary Table: Key Impact Indicators iv
Table 1 List of SLUP Area and Percentage of Area by Type of Zone 9
Table 2 Key Economic Variables for the Forest Industry, 1999 14
Table 3 Land Area and Timber Harvesting Land Base in B.C. 23
Table 4 Estimates of SLUP Impacts on Timber Harvesting Land Base 24
Table 5 Summary of Forestland Capability 26
Table 6 Areas with High and Moderate Forestland Capability by Type of Zone 27
Table 7 Forestland Capability by Planning Zone and Planning Area 29
Table 8 Summary of Mature Forest by Forestland Capability 30
Table 9 Summary of High and Moderate Mature Forest with Forestland Capability 30
Table 10 Mature Forest Cover by Planning Zone and by Planning Area 30
Table 11 Magnitude of Eventual Forest Sector Economic Impacts from New PAs 37
Table 12 Key Statistics on the B.C. Mining Sector – 1999 40
Table 13 Provincial Comparison of Exploration Expenditures, 1986-2000 42
Table 14 Key Parameters for Average Major Metal Mine 45
Table 15 Summary of Mineral Tenures and Occurrences 51
Table 16 Summary of Mineral Capability Distribution 55
Table 17 Metallic Capability in B.C. and SLUP areas by Zoning Designation 56
Table 18 Metallic Capability by SLUP Region for PAs and SMZs 57
Table 19 Oil and Gas Tenures By Type of Zone 72
Table 20 Proven and Potential Oil and Gas Reserves by Type of Zone 74
Table 21 SLUP Impacts on Potential Gas Reserves, FTEs and Government Revenues 75
Table 22 Economic Impact of Tourism and Outdoor Recreation on B.C., 1993 82
Table 23 Distribution of Mapped Tourism Values by SLUP Zone Category 86
Table 24 SLUP Impacts on Agricultural Land Reserve 96
Table 25 Protection of Terrestrial Ecosystems 102
Table 26 Wildlife Management Areas Recommended Through SLUPs 102
Table 27 LUCO Operating Budget and SLUP Related Funds, 2001-2002 118

List of Maps

Resource Management Zones in B.C. - January 2001 10

Forest Land Capability - January 2001 28
Mineral Occurrences - January 2001 53
Mineral Tenures - January 2001 54
Metallic Mineral Potential - January 2001 58
Industrial Mineral Potential - January 2001 59
Petroleum and Natural Gas Tenures - January 2001 73
Tourism Sites and Facilities - January 2001 88
Agricultural Land Reserves - January 2001 95

List of Appendices

1. Land Use Area and Percentage by Zone by SLUP Region 1-1

2. AAC Changes for B.C. Crown Lands Over the Past Decade
    2-1 All Species by TSA and TFL 2-1
    2-2 1992-1996 TSR-1 Results (TSAs and TFLs 2-3

3. Forest Indicators
    3-1 Forestland Capability 3-1
    3-2 Mature Forest Capability 3-3
    3-3 Methodology for Deriving Forest Capability Indicators 3-5

4. Mining Indicators
    4-1 Provincial Summary of Mineral Capability, Tenures and Occurrences 4-1
    4-2 Mineral Capability – Number of Hectares 4-2
    4-3 Mineral Occurrences 4-7
    4-4 Mineral Tenures 4-9
    4-5 Exploration Spending by Provinces and Territories, 1986-2000 4-12
    4-6 Mineral Price Index 4-13

5. Oil and Gas Indicators
    5-1 Oil and Gas Reserves and Gas Tenures 5-1
    5-2 Oil and Gas Tenures 5-2
    5-3 Estimated SLUP Impact on Gas Reserves, Jobs and Government Revenues 5-3

6. Tourism Indicators 6-1

7. B.C. Agricultural Land Reserve 7-1

8. List of Contacts 8-1

9. Bibliography 9-1

10. Interview Results 10-1

11. Protected Areas in British Columbia by Ecosections 11-1

Executive Summary

Background

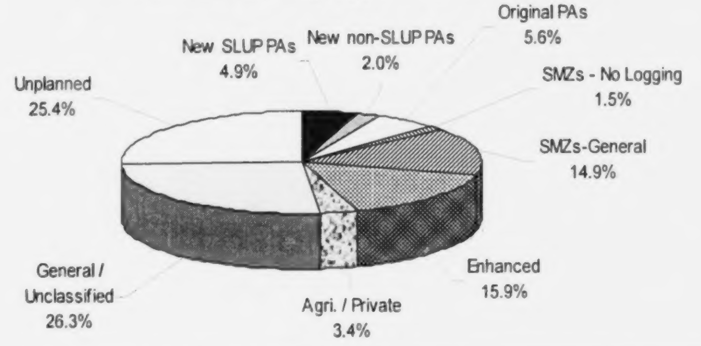
Throughout the 1970s and 1980s, B.C. experienced several bitter conflicts over resource development, recreation and environmental values. In 1992, the B.C. government developed the Protected Area Strategy (PAS) with the objective of doubling the extent of protected areas to 12% of the B.C. land base. Also in 1992, the B.C. government formulated a land use strategy to help implement the PAS and as part of the strategy, initiated regional and sub-regional land use planning processes.

Strategic Land Use Plans (SLUPs) have now been completed, or are underway, for over 85% of the B.C. land base. These SLUPs have established direction for land use through the development of various land use zones including:

- Protected Areas (PAs), which prohibit extractive resource development and restrict access;
- Special Management Zones (SMZs), where extractive resource development can occur subject to management constraints to protect specific values;
- Enhanced Resource Zones (ERZs), which are priority areas for resource development;
- General Zones, which are managed for a wide variety of resource values and permissible uses; and
- Other zones, which include unclassified lands, agriculture, private and settlement lands.

From 1992 to March 31, 2001, an additional 6.9% of the land base in B.C. was designated as protected area, 4.9% through SLUP processes and 2.0% directly through the PAS, bringing the total of protected areas in B.C. to 12.5% of the province. Some 14.9% of the land base was designated as SMZs and another 1.5% as SMZs that prohibit logging.

B.C. Land Base by Type of Land Use Zone



Note: Includes impacts of LRMPs completed before March 2001.
Source: Land Use Coordination Office (LUCO).

Purpose of the Study and Methodology

The purpose of this study is to gain a provincial perspective on the economic impacts of SLUPs and the PAS on B.C. During the course of the SLUP process, individual plan areas, and individual polygons within plan areas, benefited from some rigorous analysis of resource inventories, conflicting land uses, complementary land uses, trade-offs and impact assessments. These analyses drew on a wide variety of sometimes locally unique data sources (including the local knowledge of SLUP table participants), and used an equally wide variety of methodologies to assess the expected impacts of the plans. While the divergence in types of data sources and analytical techniques likely led to better impact assessments for each plan, it largely precluded being able to aggregate the impacts to gain a provincial perspective.

For this study, assessing provincial impacts required finding indicators that were consistent across all (or most) plan areas, and applying a consistent methodology to the impact assessment. Achieving uniformity for some of the indicators led to a loss of precision at the individual plan level, which was regrettable, but necessary. Similarly, the observed or measured impacts of the plans at the provincial level are somewhat less specific than those detailed in the SEAs for individual plans.

This analysis focuses on the major industrial sectors that depend on the land base. It was outside the scope of this project to assess the SLUP impacts on First Nations, resource based communities and environmental values, however, to help set the context for the work, the project also provides some insight into the SLUP impacts on those values.

The research for this project included a review of Geographic Information System (GIS) quantitative data prepared by LUCO that show various resource values overlain by the land use zoning designations adopted by the various plans. In addition, 76 detailed interviews with stakeholders provided qualitative data on the impacts of SLUPs on various indicators such as land use certainty, investment levels, incidence of conflicts, communication and many others. Also, staff at the Ministry of Sustainable Resource Management (MSRM) prepared an overview of environmental issues in B.C. and the impacts of SLUPs on environmental values, which is included in this report. The research was conducted prior to March 31, 2001 and therefore excludes the impacts of the Central Coast and Lillooet LRMPs.

The analysis uses some of the key elements of a Multiple Account Analysis (MAA) framework including the Base Case concept. Ideally, the Base Case should establish how development would have proceeded in the absence of the PAS and any broad area strategic planning process. Without SLUPs and the PAS, some of the new PAs such as in Clayoquot Sound and the Stein Valley would likely still have been protected, however, for the purpose of this analysis, the Base Case assumes that the land use designations in effect in 1991 would have continued indefinitely. The analysis therefore attributes all of the economic impacts of the new PAs and zone designations to the PAS and SLUPs. (It should be noted that it is highly unlikely that all of the new PAs would have been open to extractive resource development in the absence of SLUPs and the PAS, particularly since some of them were already designated as recreation or wilderness areas).

Overview of Environmental Issues and SLUP Impacts on Environmental Values (summary based on overview prepared by MSRM staff)

Ecosystems and their services have a primary value that cannot be measured since no life would exist without them. A healthy environment provides the ecological services (such as clean water, air and soil) upon which all life depends and which support all human industrial, economic, recreational, settlement and other uses. The environment provides the direct economic basis for sectors such as forestry, fisheries, agriculture, recreation and tourism. In addition, sound environmental management appears to be increasingly important in marketing goods and services produced in B.C. to international markets. It is widely recognized that avoiding environmental damage and managing in a sustainable manner is far more cost effective than restoration and repair (for example, Forest Renewal BC spending for watershed restoration between 1994 and 2001 added to some $400 million, which represents a fraction of restorative projects proposed).

The SLUP program was initiated to resolve and manage conflicts between competing values and provide an opportunity to ameliorate deterioration trends in key environmental indicators. Key environmental issues that SLUPs are hoping to influence include:

- **High Number of Threatened and Endangered Species**: B.C. has 75 species of vertebrates and 241 vascular plants listed as threatened, endangered, or candidates for these designations. Agriculture, urban development and logging are listed (in that order) as the most important threats to threatened and endangered (Red-listed) vertebrate species.
- **High and Increasing Number of Threatened and Endangered Forest Species**: Some 8% of 1,079 known forest species are threatened, endangered or are candidates for designations, and the number of threatened forest species has increased by 2% between 1997 and 1999.
- **Wildlife Habitat**: A number of managed wildlife species such as Caribou and Grizzly Bear no longer occupy significant portions of their historic ranges.
- **Degradation of Riparian areas**: Logging continues in riparian areas near streams of less than 1.5 metres wide, although the Forest Practices Code has significantly reduced logging of riparian areas beside medium to large streams.

SLUP products that affect environmental values include:

- **Protected Areas** (PAs): SLUPs and the Protected Area Strategy have led to a doubling of protected areas in the Province from 6% in 1991 to over 12% by 2001, a much broader representation of B.C.'s terrestrial ecosections in protected areas, and a larger proportion of the grizzly bear population in protected areas.
- **Legal Designations**: a number of legal designations that arise from SLUPs can be reasonably assured to benefit environmental values such as wildlife areas, no harvesting areas, harvesting deferrals, and other special designations such as the Muskwa-Kechika management area.
- **Special Management Zones** (SMZs): These should result in enhanced environmental values although management direction that varies from standard practices regarding values such as biodiversity, wildlife and fish habitat and riparian areas will likely need to be established through Higher Level Plans and other legislation before conservation can be assured:
  - Biodiversity maintenance is considered less at risk since in most SLUPs, SMZs have a greater percentage of "high" and "intermediate" biodiversity emphasis option, although this will depend on full implementation of landscape level planning.
  - Wildlife habitat should be better conserved. For example, SMZs cover about 20% of the area in SLUPs, but they include over 40% of areas with high and very high Caribou habitat
  - Many community watersheds are now in SMZs.

Caribou and Grizzly Bear are two managed wildlife species that received particular attention in SLUPs and the PAS. SMZs were frequently designated with management direction for caribou and/or grizzly bear habitat, and these species also often received consideration in establishing PAs. A very general assessment by Ministry of Water, Land and Air Protection (WLAP) staff is that provincially, SLUPs and the PAS have given us the difference between Very High Risk before them to High Risk now, in terms of the long term sustainability of the grizzly population.

It is difficult to assess SLUP impacts or outcomes to date on environmental values for several reasons. Firstly, the implementation of SLUPs is in a very early stage across the province. Secondly, environmental management objectives and targets in SLUPs are often vague, unclear or conflicting. Thirdly, the base case values against which change will be compared are rarely suitably described. Fourthly, relatively little effort has been invested in monitoring and adaptive management programs.

Summary of Quantitative Indicators of SLUP Impacts on Industrial Sectors

The following tables summarize the results for some of the more quantitative impact indicators, and some key statistics on the size of the forestry, mining, oil, gas, tourism and recreation industries.

Summary Table: Key Impact Indicators

Key Indicator	New PAs		SMZs	ERZs
	SLUP	Non-SLUP		
Percentage of BC Land Base	4.9%	2.0%	16.4%	15.9%
FORESTRY[1]:				
% high capability forestland	4.1%	0.3%	11.7%	30.6%
% mature forest with high capability	5.2%	0.7%	12.5%	28.5%
OIL AND GAS (B.C. Northeast)[2] :				
% oil and gas tenures	0.4%	0%	6.5%	45.3%
% gas tenures	0.6%	0%	4.9%	N/A
% high proven oil reserves	0.4%	0%	0.4%	N/A
% high proven gas reserves	1.0%	0%	2.7%	N/A
% high potential gas reserves	9.9%	0%	16.7%	N/A
% moderate potential gas reserves	1.9%	0%	8.8%	N/A
MINING:				
% coal tenures	0.3%	0%	11.5%	31.6%
% mineral tenures	1%	0.8%	23.8%	13.3%
% mineral occurrences	2.8%	1.3%	17.8%	6.9%
% high metallic capability areas	4.0%	2.8%	15.5%	13.1%
% moderate metallic capability areas	4.8%	2.5%	14.7%	15.5%
TOURISM:				
% existing tourism use areas	6.6%	3.9%	27.5%	10.2%
% special tourism features	9.9%	2.5%	25.4%	19.5%
AGRICULTURE: Agriculture Land Res.	1.5%	0%	6.4%	24.5%
DATA ON PLANNED AREAS ONLY:				
% of SLUP Planned Area	6.9%	0.4%	22.8%	22.5%
% of Timber Harvesting Land Base	4.39%	N/A	14.28%	N/A

Size of Forestry, Mining, Oil and Gas and Tourism/Recreation	
Forestry	• 90,600 Person Years (PYs) of employment (1999 data), of which 56,900 PYs are in primary logging, silviculture and wood processing • Average salary: $67,042 per PY (with benefits) • Generated $1.4 billion in stumpage and royalties and another $1.1 billion in other industry payments to governments (excludes taxes paid by employees) • Accounts for approximately 6% of provincial GDP
Mining	• 9,540 PYs including 3,200 PYs in coal mining, 950 PYs in exploration and 5,400 PYs in metal mining and smelting • $74,850 per PY (with benefits) • $29 million in mining and mineral taxes and another $147 million in other industry payment to governments (excludes taxes paid by employees) • Aluminum smelting, construction aggregate and downstream mineral sector (iron, steel, asphalt, cement, etc.) account for another 9,279 PYs.
Oil and Gas	• 7,000 PYs in exploration and wellhead production; • Another 9,200 PYs in refining and downstream segment (excluding retailing) • $1.3 billion in royalties and disposition bonuses (2000) to government, up from $228 million in 1989 and $587 million in 1999.
Tourism / Recreation	• Tourism generates 110,800 part time and full time jobs and contributes approximately 4.8% to the provincial GDP. • Backcountry tourism accounts for between 4% and 9% of tourism depending on measure used • An estimated 25% of tourism expenditures depend on outdoor recreation • Outdoor recreation not associated with tourism generates another 45,000 jobs • The BC Park system sustains approximately 9,100 direct and indirect Person Years of employment and accounts for some 0.5% of the provincial GDP • The tourism sector pays permit fees to governments but no royalty payments

Notes to Summary Tables:

N/A: Not readily available.

1. High capability forestland areas are based on bio-geoclimatic zones and represent a very general estimate of the lands that may be capable of sustaining forest harvesting activity. The mature forest estimate shows how much of the land is covered by potentially immediately harvestable forests. No-logging SMZs included in the general SMZ category account for 0.4% of the high capability forestland area and 0.6% of the mature forest on high capability forestland.
2. Includes the planned areas of Dawson Creek, Fort St. John, Fort Nelson and Mackenzie areas. The percentages in ERZs are not consistently reported in the Socio-Economic Analysis for each of those regions.

Source: Prepared by Pierce Lefebvre Consulting based on data supplied by LUCO (impact analysis by type of land use zone) and various sources for economic data (e.g. size of each sector), as noted in the report.

When reviewing the Summary Tables, it is important to keep in mind that some of the regions took some unique approaches to defining land use zones, which makes it somewhat difficult to compare the impacts across regions. For example, the Cassiar-Iskut LRMP used PAs and general zones, but rather than SMZs, it specified some no-logging zones and general management zones with area specific directions. While some of the Cassiar-Iskut polygons with area specific directions impose very few restrictive constraints, they were all included as SMZs for the purposes of this analysis.

The Summary Table on key industrial impact indicators shows the following:

- New PAs contain some important timber values, however, they capture a lower proportion (4.4%) of the high capability forestland in the province than their total area (6.9%) might suggest. New PAs account for 5.9% of the province' s mature forest on high capability forestland, which is less than their total area (6.9%) might suggest but is more than the high capability forestland contained in the PAs (4.4%). This might be expected since most PAs are protecting relatively undisturbed areas.

- SMZs contain some 16.4% of the B.C. land base (and 22.8% of the planned areas). Some SMZs are no-logging zones, but most permit logging with varying degrees of special management constraint to protect one or more non-timber values. SMZs cover 11.7% of the high capability forestland and 12.5% of the mature forestland in high capability areas.

- ERZs account for 15.9% of the B.C. land base (and 22.5% of planned areas); however, they contain approximately 30% of the high capability forestland and mature forest in high capability forestlands. Most ERZs were established to enhance timber values and the data show that ERZs do cover a large proportion of the high capability forestlands, at least in the SLUP regions that have used ERZs extensively. Regions with a substantial percentage of the high capability forestlands in ERZs include the Cariboo-Chilcotin region, the Omineca-Peace region and Vancouver Island. Regions with limited or no ERZs include the Kamloops region, the Kootenay-Boundary region (although subsequent development of the Higher Level Plan has established significant ERZs for forestry) and the Prince-Rupert region.

- New PAs include less than 1% of oil and gas tenures and proven oil and gas reserves and as a result, have had limited or no impact on the high activity areas of the B.C. Northeast. The main impacts of new PAs fall on potential gas reserves with PAs capturing 10% of high potential gas reserves.

- SMZs include 6.5% of oil and gas tenures but less than 3% of proven oil and gas reserves. SMZs cover 27% of the B.C. Northeast land area, but only 16.7% of the high potential gas reserves in the area are in SMZs. While SMZs permit oil and gas resource development, companies operating in the SMZs and in particular in the Muskwa-Kechika region are experiencing delays and higher drilling costs. The table shows that some 45% of oil and gas tenures are in ERZs.

- New PAs include almost no coal tenures. Some 11.5% of provincial coal tenures are in SMZs, mainly in the Cassiar-Iskut region (where 72% of all coal tenures are in SMZs) and Dawson Creek (where 25% are in SMZs). A relatively high proportion (31.6%) of coal tenures are in ERZs with the Kootenays accounting for 69% of the coal tenures in ERZs and Dawson Creek accounting for the other 31%). The Kootenays' ERZs especially targeted coal mining values and in that region, ERZs account for over 75% of coal tenures but only 1% of the land base.

- New PAs include relatively few mineral tenures and mineral occurrences implying that known mineral resources were generally avoided when establishing PAs. The more vague indicator of perhaps longer term potential (capability) appears to have received less consideration, or has been heavily discounted in impact analyses. Areas of high or moderate mineral capability are proportionally represented in new PAs and do not appear to have been specifically avoided when establishing PA boundaries.

- SMZs cover approximately the same proportion of mineral tenures, mineral occurrences and metallic capability areas as their 16.4% of the BC land base. ERZs account for 16% of the B.C. land base and a comparable proportion of mineral values (except for mineral occurrences which at 6.9% are substantially under-represented in ERZs).

- New PAs seem to have targeted areas of high existing tourism use. Provincial parks play an important role in providing recreational opportunities and generate significant economic activity for the province.

- SMZs account for a greater proportion of tourism use areas and tourism features than their 16.4% proportion of the total B.C. land area.

- New PAs and SMZs include proportionally little agricultural reserve lands.

Summary of Interview Results

The following table shows some of the results from interviews with stakeholders.

Number of Interviews	• Forestry	20	• Interviews were chosen from a list of informed stakeholder representatives – not a random sample. • Approximately 75% of those interviewed were directly involved in one or more SLUPs. • Coverage includes representatives from 14 major forest licensees (combined employment of 19,710 people in B.C.), 5 major mining companies (combined employment of 6,800) and many other industry representatives from smaller companies in these and other sectors.
	• Mining	12	
	• Oil and Gas	5	
	• Tourism/ Rec.	13	
	• Other	15	
	• Sub-total	65	
	• First Nations	5	
	• Environment	6	
	• Total	76	
Communication between stakeholders	• Better	25	Those who believe SLUPs have led to better communication between stakeholders are in forestry (16), mining (1), oil and gas (3), tourism/recreation (10), other (11) and First Nations (5).
	• Slightly better	21	
	• About same	15	
	• Decreased	4	
	• Total interviews	65	
Conflicts with environmental groups	• Decreased	12	Those who believe SLUPs have led to fewer conflicts with environmental groups are in forestry (12), mining (1), oil and gas (3), tourism/recreation (5) and other (11).
	• Slightly decreased	20	
	• About same	20	
	• Increased	8	
	• Total interviews	60	
Impact on land use certainty	• Increased	45	The 15 who believe that SLUPs negatively affected land use certainty are in mining (10), forestry (3) and tourism (2).
	• About same	15	
	• Decreased	15	
	• Total interviews	75	
Impact on investment	• Increased	9	Those who believe SLUPs increased investment are in forestry (3), tourism (3) and government (3). Those who believe SLUPs decreased investment include every interviewee in the mining sector and a cross section in other sectors.
	• About same	20	
	• Decreased	30	
	• Total interviews	59	

Impact on resource inventories	Much Better	18	Most interviewees believe that SLUPs have led to better resource inventories developed by governments. SLUPs have also helped identify the need for inventory information and helped prioritize funding. In mining, however, interviewees believe that the reduced exploration expenditures have negatively impacted resource inventories.
	Better	28	
	About same	23	
	Worse	1	
	Total interviews	70	
Other indicators	The report summarizes the interview results regarding many other indicators including the impact on conflicts with other stakeholders, the forest certification process, operating and planning costs, community capacity, etc.		

Evaluation of Potential Benefits Associated with SLUPs

This study assessed, through interviews and other data, whether the following benefits expected from SLUPs have materialized.

- **A reduction in conflict over land and resource use**: The interviews suggest that SLUPs have succeeded to some degree in reducing conflict. Land use conflicts involving the forest industry are perceived to have been reduced (or pre-empted) in many areas with the exceptions of the Kootenays and in some regions of the South/ Central Coast. Conflicts have been reduced on Vancouver Island but they have continued in the Lower Mainland area and in the Central Coast. Interviewees believe that in those regions, environmental groups have not bought into the process. In the Lower Mainland region in particular, only a Protected Area Strategy has been completed and conflicts between environmental groups and the forest industry has continued.

  Conflicts may have been pre-empted for the oil and gas sector, and somewhat reduced for the tourism and recreation sectors. Conflicts involving First Nations have not been significantly affected by SLUPs, and the mining industry believes that conflicts with environmentalists have actually increased because of SLUPs and the PAS.

- **Increased stability and certainty in land use and resource management** Most stakeholders believe that SLUPs have generally led to greater land use certainty, except in the Kootenays, and in some Coastal regions where SLUPs have not yet been complete. SLUPs have, so far, led to less certainty regarding land use and management direction in SMZs, particularly for the mining sector.

- **Increase in the Hectarage and Ecosystem Representation of PAs**: Between 1991 and 2001, total protected area increased from some 5.3 million hectares to 11.9 million hectares and the proportion of B.C.'s terrestrial ecosections with at least 12% in PAs rose from 16% to 39% of the identified terrestrial ecosections in the province. Also during that same time frame, the percentage of ecosections with less then 1% in PAs has dropped from 53% of the identified ecosystems in the province in 1991 to 12% by 2001.

- **Sustainable management of land and resources on Crown land**: SLUPs have led to changes in managing for environmental values and have helped raise public awareness of environmental objectives and sustainable development.

- **A more efficient allocation of the land base**: Planning should be better than not planning if there is sufficient information available on resource values and social preferences. There is anecdotal and quantitative evidence from some plan areas that the planning process yielded social efficiencies in organizing land and resource use to maximize overall value (e.g. timber, biodiversity and wildlife habitat values are strategically managed to create more overall value than might have occurred from a more ad-hoc management regime). On the other hand, the mining industry has argued that there is not sufficient information available on sub-surface resource values to plan effectively, and that ad-hoc management would be preferred.

- **A framework to direct development and approval of operational plans and resource development permits**: SLUPs have provided a framework to the forest sector for approving Forest Development Plans (FDPs) and these are typically approved more quickly when in General zones and ERZs. In the oil and gas sector, SLUPs may have pre-empted permit delays in the northeast as most of the high drilling activity is taking place in General Zones and ERZs, although pre-tenure planning requirements are resulting in more delays in approving oil and gas drilling permits in the M-K region. The process has not been fully tested for other sectors such as mining development.

- **Improved natural resource databases and analytical tools**: SLUPs have led to better inventories for environmental values, tourism, forestry and First Nations. Also, mineral potential assessment has been completed for all of B.C.

- **Improved management tools and processes for government agencies**: Government agency representatives generally believe that SLUPs have had a positive impact on communication between the various agencies and that this has led to better cooperation and efficiency in land management. For many interviewees, this has been one of the greatest benefits of SLUPs.

- **Increased community capacity** (e.g., improved skills, understanding, and ability in land use planning): SLUPs have helped develop the capacity of First Nations and resource-based communities to take part in land use planning decisions, however, this seems to have been the case only for the few First Nations communities who took part in the SLUP process, and for those individuals in resource-based communities who played a key role in the process.

- **Clarification of land use objectives to assist treaty negotiations**: This study did not collect any data or opinions on how SLUPs affected treaty negotiations.

- **Increased public understanding and awareness of resource use issues**: SLUPs have raised public awareness of environmental objectives and the complexities of integrated resource management.

- **Development of strategies to mitigate impacts related to changing social values**: The land use planning process has helped develop strategies to mitigate the impacts of new PAs on the forest sector, including the establishment of ERZs, and identifying strategies that the Ministry of Forests may wish to consider to maintain the Allowable Annual Cut (AAC) in the short and medium term in spite of impacts on the Timber Harvesting Land Base (THLB).

- **Better protection of First Nations Values**: Most SLUPs attempted to involve First Nations in the land use process, but First Nations declined to be actively involved until fairly recently. Interviews were completed with some of the First Nations that have been involved in SLUPs. Three out of five believe that SLUPs have led to better protection of traditional values that are of interest to First Nations, while the other 2 said they believe that SLUPs have not. SLUPs have led to better awareness of First Nations values.

Evaluation of Potential Costs Associated with SLUPs

- **Reductions in the size of the timber harvesting land base (THLB)**: SLUPs and the PAS have negatively impacted the THLB, but appear to have avoided high capability forestlands to some degree, when establishing PAs. Many of the management directions suggested in SLUPs appear to fall within the broad range of the FPC, but for most planning areas the impacts of SMZs on the THLB have yet to be determined. There might be opportunities for the ERZs to offset to some degree, any negative impacts from SMZs, at least for the regions that chose to designate ERZs.

- **Negative impact on investment**: The main negative impact of SLUPs on investment has been on mineral exploration investment. In B.C., some on-site mineral exploration has continued but more speculative exploration has essentially ceased. Obtaining financing for speculative exploration has been nearly impossible for the past several years. While these negative trends are not mainly the result of SLUPs and the PAS, B.C. does seem to have suffered more than other provinces. The mining industry's main point of contention with SLUPs and the PAS is the reduced likelihood that any mineral deposit, if found, would be developed in an SMZ, and particularly in the Muskwa-Kechika area or in proximity to a PA. The reduced exploration effort has decreased the likelihood of identifying and developing new mines and it has negatively affected the development of mineral inventories in B.C.

  SLUPs have not negatively impacted investment in the forest sector except in the Kootenays and on Vancouver Island where interviewees attribute some of the decline in the AAC in those regions to SLUPs and the PAS, and the AAC decline has negatively affected investment in those regions. In the other regions, half of the interviewees in the forest industry believe that SLUPs have had no impact on investment, mainly because land use certainty is only one factor affecting investment and because SLUPs are too recent to have had much impact. Some interviewees in the Interior believe that SLUPs resulted in companies proceeding with investment plans.

  SLUPs seem to have had limited or no impact on existing oil and gas operations, although delays in completing the pre-tenure planning required in the M-K region may have affected the timing of exploration and oil and gas reserve additions.

  Opinions were mixed on whether SLUPs affected investment in the tourism sector. Most tourism sector interviewees believe, however, that restrictions in PAs will hinder tourism development.

- **Job losses associated with reductions in resource extraction and related activities**: SLUPs have generally attempted to mitigate impacts on existing operations. In forestry, this has typically meant identifying ways of limiting the impacts on current harvesting areas with an objective of maintaining the AAC for at least one decade. In mining, SLUPs have attempted to avoid existing mines or developed deposits when establishing PAs and SMZs (although there are significant regional variations, particularly in the Muskwa-Kechika area). In oil and gas, virtually all the high activity areas are in ERZs or in general zones. In tourism, most existing operations in PAs have been grand-fathered. In agriculture, grazing rights have also been grand-fathered.

Once the SLUP and PAS impacts are fully experienced, they may ultimately reduce forest industry employment potential by 2,000 PYs in primary forest sector employment and another 1,200 PYs in value added and other operations (approximately 3.5% of current employment). The reduced potential represents a very rough estimate of the economic costs of setting aside an additional 4.4% of high capability forestlands in new PAs. Driving the economic impact estimates is the major assumption that the withdrawal of high capability forestlands causes a proportional change in the annual volume of crown timber harvested and processed. The reality is much more complex as many factors affect the annual harvest. For most B.C. regions, the impacts are not likely to be felt for at least 10 years, and in some regions much further into the future.

Some 200 PYs in mineral exploration employment may have been lost in each of the past several years (approximately 20% of all exploration jobs in 1999). In the longer term, the reduced exploration effort and perceived risks of attempting to develop deposits in SMZs may put metal mine development and metal mining operation jobs at risk. In the oil and gas sector, an average of 275 PYs per annum may be jeopardized over the next 20 years (representing some 5.2% of the 5,300 upstream jobs in 1998), as a result of constraints on the rate of growth of gas exploration.

It is not clear whether the SLUPs and the PAS will have a net positive impact on job opportunities in the tourism and recreation sectors.

The above noted impacts may be offset to some extent by positive impacts associated with reduced conflict and other benefits. Also, as noted before, this assumes that the land use designations in effect in 1991 would have continued indefinitely and that all new protected areas would have been open to extractive resource development.

- **Loss of economic base for resource dependent communities**: Resource-based communities in Coastal B.C. and in the Kootenays are likely to face the costs of SLUPs sooner than most other B.C. regions, where the negative impacts on forestry are likely to be deferred for at least 1 or 2 decades (some Coastal communities have already felt the impact of the VILUP and the PAS). In the longer term, some resource-based communities may bear the costs in terms of foregone opportunities in forestry, mining and oil and gas. These same communities may benefit from opportunities in tourism and recreation, which may continue to develop over the longer term and could offset to some degree the foregone opportunities in extractive resource industries.
- **Increased costs for government agencies to implement management direction provided in plans** (e.g., protected area management plans): LUCO had an annual budget of $4.3 million and in addition, it administered some $10.5 million in various funds directed at preserving certain values (Spring 2001 budget for 2001/2002). This does not recognize the additional

costs of participating in planning or managing resource values in the other agencies. It is beyond the scope of this study to evaluate the SLUP process and the costs associated with that process as a complete review would require an analysis of how SLUP funding may be lowering costs in other aspects of administration. For example, SLUP funding includes the costs of Inter-Agency Management Committee (IAMCs) meetings that would likely take place in some form regardless of SLUPs. Many interviewees suggested that the current level of resources being directed to land and resource management is not nearly sufficient to implement the plans.

- **Loss of government revenues**: The forest industry provided $1.4 billion in resource rents to the provincial government in 1999. Alienating 4.4% of the high capability forestland in new PAs could ultimately lead to a $56 million dollar reduction in annual stumpage, rents and royalties, but most of this impact will likely be deferred for several decades. There is no direct, proportional link between the high capability forestland set aside in new PAs and the current AAC. As a result, in most B.C. regions, the impacts of the new PAs are not likely to be felt for at least 10 years.

  The oil and gas sector provided $1.3 billion in rents, royalties and disposition bonuses to the provincial government in 2000. SLUPs have had little impact on proven oil and gas reserves and on high activity areas, except that there may be more drilling in some regions than there would otherwise be. The main impact of PAs and land use plans has been on potential reserves (high and moderate potential). Slower growth in natural gas production and revenues due to new PAs and SMZs may result in an eventual annual loss of $60 million in government revenues (based on Fort Nelson, Fort St. John and Dawson Creek SEAs, 1996-1999).

  Direct mining taxes and fees related to tourism use are not significant in comparison, and any reduction in activity in these sectors due to SLUPs would have little direct impact on government resource rents.

  In addition to the resource rent impacts, reduction in activity in any of these sectors would lead to other reductions in provincial government revenues such as sales taxes, corporate income taxes and personal income taxes.

- **Increased regulatory constraints for development approvals**. SLUPs have led to additional regulatory requirements for Forest Development Plans (FDPs) in SMZs in the Cariboo region and Low Intensity Zones in Vancouver Island where joint approval of MoF and MELP is required. The interviewees also perceive that there are increased regulatory constraints in the Muskwa-Kechika region because of the region's legislated status and requirements for local level planning.

The report summarizes the study findings on many other indicators of SLUP impacts. These include the SLUP impacts on the Forest Development Plan (FDP) approval process, the forest certification process, the mine approval process, operating and planning costs, commercial recreation tenures, economic diversification, community growth and community capacity.

1. Introduction

1.1 Background and Purpose of this Study

In 1992, the provincial government developed an action plan to double the extent of Protected Areas (PAs) by the year 2000, to 12% of the land base. Partly as a way of implementing this Protected Area Strategy (PAS), the government embarked on a process to develop Strategic Land Use Plans (SLUPs) for large areas of B.C. Other key objectives of SLUPs were to reduce public conflict over land use and provide strategic direction for the sustainable use of land and resources.

SLUPs have now been completed or are underway for approximately 85 % of the province's land base. Approximately 12.5% of B.C.'s land base has been protected, excluding the Central Coast and Lillooet agreements reached in the spring of 2001. SLUPs have been credited with providing a number of important benefits including:

- A reduction in conflict over land and resource use
- Increased stability and certainty in land use and resource management
- Increase in the hectarage and ecosystem representation of protected areas
- Sustainable management of land and resources on Crown land
- A more efficient allocation of the land base
- A framework to direct development and approval of operational plans and resource development permits
- Improved natural resource data bases and analytical tools
- Improved management tools and processes for government agencies
- Increased community capacity (e.g., improved skills, understanding, and ability in land use planning)
- Clarification of land use objectives to assist treaty negotiations
- Increased public understanding and awareness of resource use issues
- Development of strategies to mitigate impacts related to changing social values

At the same time, strategic land use plans have also been criticized for generating negative impacts including:

- Reductions in the size of the timber harvesting land base
- Negative impact on investment in mining exploration and development
- Job losses associated with reductions in resource extraction and related activities
- Loss of economic base for resource dependent communities
- Increased costs for government agencies to implement management direction provided in plans (e.g., protected area management plans)
- Loss of government revenues
- Increased regulatory constraints for development approvals.

For each region that has undergone a land use process, government agencies have assembled socio-economic impact data on the region in the form of Multiple-Account-Analyses (MAAs). In general, the MAAs document the impacts the land use decisions might have on economic growth, the use of the forestlands and other economic benefits and costs. However, the MAAs do not provide information on some of the less quantifiable benefits and costs that may be associated with the land use process. Some of these include:

- The impacts of completed land use plans on reducing land use uncertainty and the potential impacts this may have on investment patterns.
- The impacts of completed land use plans on the streamlining of permit applications.
- The potential that land use plans may facilitate the obtaining of environmental certifications for forest products and help secure overseas markets (or reduce the likelihood of being targeted by environmental groups).
- The impacts on relationships between sectors, communities and with First Nations.

The purpose of this study is to assess the economic impacts of SLUPs in B.C. taking into account the quantifiable but also qualitative costs and benefits.

This has been an ambitious project to be conducted over only a few months. As a result, not all areas have been addressed with the same clarity and detail. Part of the purpose in embarking on this project has been to develop a framework and a methodology that will hopefully be useful in future evaluations of the land use planning process.

1.2 Approach and Methodology

Our approach was designed to provide an assessment of the advantages and disadvantages of SLUPs using elements of a Multiple Account Analysis (MAA) framework. A key component of such a framework is the development of a Base Case scenario, which would ideally try to establish how development would proceed in the absence of a broad area strategic planning process. In an ideal situation, the Base Case scenario would then be compared to what is actually occurring, or is likely to occur, in areas that have engaged in a SLUP and various indicators describing the differences are measured and tabulated.

A major issue in developing a Base Case for this study is that in the absence of SLUPs and the PAS, some areas of B.C. would likely have been protected anyway, as a result of continuing pressures from the international community and from local residents. Some of the Socio-Economic Analyses (SEAs) conducted for individual SLUP regions have recognized this and therefore included varying levels of new protected areas as part of their Base Case. Some of the more recent SEAs went even further and identified a full range of protected areas and resource management zones that would likely result in the absence of a consensus SLUP. For those SEAs, the Base Case becomes another land use zoning scenario against which to assess alternative plans.

The purpose of this study is to assess the impacts of the SLUPs and the Protected Area Strategy (PAS). Without SLUPs and the PAS, some of the new PAs such as Clayoquot Sound and the Stein Valley would likely still have been protected, however, for the purpose of this analysis, the Base Case assumes that the land use designations in effect in 1991 would have prevailed. The analysis therefore attributes all of the socio-economic impacts of the new PAs and zone designations to the PAS and SLUPs. It also attributes any perceived changes in land use conflict, land use efficiencies, resource inventories, stakeholder communication, etc. to those two initiatives.

The Base Case includes other government initiatives such as the Forest Practices Code (FPC) and the Mineral Exploration Code. The FPC was enacted in 1995 to establish new guidelines for harvesting timber, and some of the earlier plans such as the CORE plans for the Cariboo-Chilcotin, Kootenays and Vancouver Island excluded the FPC from their Base Case. As a result, the initial assessments of the CORE plans combined the impacts of the FPC with the SLUP impacts.

The various steps undertaken as part of this work included:

- Developed key indicators for assessing the benefits and costs of SLUPs;
- Reviewed existing studies and data collected as part of the SEAs conducted for the SLUPs and other land-based processes such as the Timber Supply Review (TSR) of the Ministry of Forests (MOF);
- Conducted approximately 75 detailed interviews with stakeholders and others who took part in SLUPs or were affected by the results of SLUPs. This included representatives from industry, government and other organizations to collect information on the costs and benefits associated with SLUPs in B.C. Through these interviews, also collected information on land use planning in other Canadian jurisdictions.
- Reviewed the socio-economic context for each industry sector affected by SLUPs and collected indicators of potential job impacts and other socio-economic variables by sector (e.g. Person Years (PYs) of employment, exploration expenditures, government revenues, etc.)
- Worked closely in collaboration with LUCO to review and analyze provincial wide coverage of selected key indicators of timber, mining, tourism, agriculture and other values by type of land use planning zone.
- Using the 1991 protected areas as the Base Case, assessed the costs and benefits of SLUPs on several accounts:
    - Economic account including each major sector relying on the land base. This considers various factors including the impact on investment intentions, growth prospects, business activity and permit approvals.
    - Social Account including some of the social impacts that flow from the economic impacts, such as jobs, but also more intangible impacts such as changes in relationships between sectors.
    - First Nations implications – for example, did land use process help or hinder relationships with First Nations?
    - Government financial implications of crown land use plans including administration costs and the costs and benefits relating to resource development.
    - Environmental implications including general impacts on fish, wildlife, water, habitat, biodiversity and visual quality values to help set the context for the socio-economic analysis.
- Summarize findings in a draft and final report.

The research was conducted primarily from January to March 2001 with the analysis and reporting taking place in April, May and June 2001. Sylvie Lefebvre (project manager) and Claude Pierce of *Pierce Lefebvre Consulting* were the main consultants and carried out the bulk of the data collection and review. Stuart Gale provided assistance and advice on the Strategic Land Use process and was the key consultant on the overview of SLUP impacts on the environment and on First Nations. Brian Scarfe of *BriMar Consultants* provided advice on all resource sectors and in particular assisted with the analysis of SLUP impacts on the oil and gas and mining sectors. Nancy Butler at the Land Use Coordination Office in Victoria provided the GIS data and associated maps. MSRM staff provided a subsequent overview of environmental issues addressed by SLUPs.

1.3 Report Outline

This report includes:

- A discussion of the rationale for SLUPs in B.C.
- An assessment of the overall qualitative and quantitative benefits and costs associated with SLUPs in B.C. for the major primary industrial sectors that rely on the land base including the forest industry, mining industry, oil and gas sector, tourism/recreation and the agriculture sector.
- An overview of environmental issues addressed through SLUPs (prepared by MSRM staff).
- Some insight into the SLUP impacts on environmental values, First Nations, resource communities and other interests.
- A comparison between SLUPs in B.C. and other provincial jurisdictions (based on interviews with individual sectors).
- Detailed maps and data providing province wide coverage of key indicators demonstrating the distribution of timber, mineral, oil and gas, tourism and agricultural values.
- The results from over 75 detailed interviews with stakeholders, who participated in the SLUPs or were affected by the implementation SLUPs, separated by sector and by region.
- An executive summary.
- Various Appendices summarizing data on key indicators for each of the major primary sectors.

This report does not address all issues with the same level of certainty or clarity but it helps set a framework and a methodology that will hopefully be useful in future evaluations of the land use planning process.

2. The Strategic Land Use Planning Process

2.1 Rationale for SLUPs and Historical Highlights

Throughout the 1970s and 1980s several bitter conflicts arose over resource extraction, recreation and environmental values in British Columbia. Vancouver Island, and in particular the West Coast of the Island, was the location of several high profile disputes. Some of the well-known disputes included Kyuquot Sound (1980s), Meares Island (1980s), Clayoquot Sound (late 1980s) and the Carmanah Valley (early 1990s). Other regions of B.C. were also subject to increasing resource use conflict including the Stein Valley in the Lillooet region and the Slocan Valley in the Kootenays.

In 1992, the B.C. Government developed an action plan to double the extent of protected areas by the year 2000, from approximately 6% to 12% of the land base. The 12% target was inspired by a report by the United Nations' Brundtland Commission in the late 1980s.

During the 1980s, the B.C. government started to adopt consensus-based processes to help resolve land use planning disputes such as those in Clayoquot Sound. Although some of these early processes failed in that they did not achieve consensus, they also provided important lessons about process design and decision-making. In 1992, the B.C. government created the Commission on Resources and Environment (CORE) with a mandate to formulate a provincial land use strategy and to facilitate the development of strategic land use plans in three of the more contentious regions of the province (Vancouver Island, Cariboo-Chilcotin and the Kootenays).

At the same time, provincial resource agencies began to develop land and resource management plans (LRMP) at the sub-regional level. These processes were also consensus-based processes and after the windup of CORE in 1996 became the basis for strategic land use planning in the province. Key principles of LRMP include requirements for consideration of all resource values and resource sustainability, public participation, interagency coordination, Aboriginal participation, and the development of consensus-based land and resource management.

Strategic Land Use Plans (SLUPs) have now been completed or are underway for approximately 85 percent of the province's land base. These plans provide direction for land/coastal use and specify broad resource management objectives and strategies.

Key objectives of SLUPs have been to help implement PAS, to reduce public conflict over land use and to set strategic direction for the sustainable use of land and resources. With the introduction of SLUPs, the people of B.C., direct stakeholders, First Nations, Local Government, and government agencies were invited to participate in a consensus-based negotiation process to reach agreement on objectives and strategies for managing large areas of the Crown land base. These processes have tended to result in consensus, or near consensus, among participants' recommendations for sustainable management of land and resources.

The intent of SLUPs is to consider all resource values and achieve a balance of social, economic and environmental interests thereby increasing certainty and stability in resource management. Ideally, SLUPs establish direction for land use through the development of resource management objectives and strategies and the establishment of resource management zones. They provide a comprehensive, broadly accepted and approved management framework to guide resource development and more detailed planning. Strategic land use plans generally include:

- Broad land/coastal use zones that are delineated on a map
- Resource management objectives for land/coastal use zones
- Broad strategies for integrating resource uses
- Socio-economic analyses
- Implementation strategies to guide individual agencies
- Priorities for subsequent, more detailed planning

The following lists some historical highlights of the Strategic Land Use Planning Process in B.C.

Year	Historical Highlights
1992/1993	• B.C. government develops a Protected Area Strategy and sets the goal of protecting 12% of the land base.
1992	• Establishment of the Commission on Resources and the Environment (CORE)
1994	• Completion of Vancouver Island Land Use Plan (VILUP) • Agreement on Cariboo-Chilcotin Land Use Plan (CCLUP)
1995	• Approval of West Kootenay-Boundary and East Kootenay Land Use Plans • Kamloops Land and Resource Management Plan (LRMP) is the first sub-regional plan to be adopted
1996	• Completion of the Lower Mainland Protected Area Strategy; 23 new parks are added to the region. • 14 land use planning processes are established throughout B.C. • Approval of Kispiox LRMP
1997	• Approval of Bulkley, Vanderhoof, Fort Nelson and Fort-St. John LRMPs
1998	• Legislation establishes the Muskwa-Kechika Management (M-K) Area, which includes parks, and Special Management Zones (SMZs) over a large portion of the B.C. Northeast.
1999	• Approval of Prince George, Dawson Creek, Robson Valley, Fort St. James and Lakes District LRMPs • Approval of Upper Kispiox/ Seven Sisters LRMP addition
2000	• Approval of Cassiar Iskut-Stikine and Mackenzie LRMPs; Mackenzie LRMP added 1.9 million hectares to the Muskwa-Kechika Management Area, making it a 6.3 million hectare area. • Approval of Kalum South LRMP
2001	• Approval of Okanagan-Shuswap LRMP

Source: B.C. Government Press Release, *B.C. Surpasses Target of Protecting Land*, January 19, 2001.

Plans that were underway as of March 31, 2001 include:

- North Coast
- Queen Charlotte Islands/ Haida Gwaii (although progress has halted in this region)
- Central Coast (Phase 1 was completed in Spring 2001 but the results are not considered in this analysis, particularly since the interviews conducted as part of this study were completed before the approval of Phase 1).
- Sunshine Coast
- Sea-to-Sky
- Lillooet (as with the Central Coast, Phase 1 was completed in Spring 2001 but the results are not considered in this analysis).

Areas, which do not yet have any strategic planning initiatives underway include Atlin-Taku and Dease Liard in northwestern B.C., the Nass region, Morice region and Merritt and Chilliwack Forest Districts.

2.2 Overview of the Plans

As noted earlier, SLUPs establish direction for land use through the development of various types of resource management zones. In general, the plans have used the following types of zones:

- **Protected Areas (PAs)**: These areas prohibit extractive resource development and carefully manage access and development for any other purpose. These include the PAs that resulted from SLUPs, the PAs that have been designated since 1991 through the PAS, but independent of any SLUP process, and the original PAs that existed prior to SLUPs.

- **Special Management Zones (SMZs)**: These zones focus on conservation of one or more values while enabling resource development. In a few instances, they include special zones that prohibit logging but permit mining (Special – no logging, Special – wildland). The constraints within each SMZ vary widely across each region and for various polygons within each region.

- **Enhanced Resource Zones (ERZs)**: These zones are priority areas for resource development and usually timber production in particular. Although still subject to various legislation such as the Forest Practices Code and the Mineral Exploration Code, these regions have been designated for more intensive development than the general zones.

- **General Zones**: These areas are managed for a wide variety of resource values and permissible uses.

- **Agriculture, Settlement and Unclassified Areas**: These include private lands, lands subject to municipal and local government zoning, areas in the Agricultural Land Reserve as well as areas which remain unclassified.

While most SLUP regions adopted a similar set of classifications, some of the regions took more unique approaches.

- The Okanagan plan area has an approved LRMP, but did not follow the zoning designation system used by other plan areas. There are designated protected areas but no other zoned polygons. For this analysis, all unclassified lands are treated as General resource management zones, even though some special management guidelines apply to those areas.

- The Cassiar Iskut-Stikine (CIS) LRMP also used a different classification system than most other plans. It used PAs and general zones, but rather than SMZs, it specified some no-logging zones and general management zones with area specific direction. While some of the polygons in those zones with area specific direction offer very few restrictive constraints, the analysts who undertook the SEA felt that many were more "special management" in nature. As a result, all zones with area specific direction were included as SMZs for the purposes of this analysis. This must be taken into account when reviewing the data, particularly in the mining sector as many of the area specific directions do not apply to mining.

The Lower Mainland area is also different from other planned areas in B.C. in that it has only a Protected Area Strategy (PAS) rather than a complete land use plan. As a result, there are designated protected areas (PAs) and a few areas that are to be managed for special values such as the protection of spotted owls, but the rest of the area is unplanned. The Lower Mainland area covers 4.684 million hectares and includes the Chilliwack, Squamish and Sunshine Coast Forest Districts.

Those three districts were initially grouped as one area early in the planning process, but were subsequently split for sub-regional planning. Two LRMPs are now underway for the Squamish (Sea-to-Sky) and Sunshine Coast Forest Districts. In the table following, the Lower Mainland area includes only the PAs and the SMZs as defined in the PAS. Areas outside PAs and SMZs for the Lower Mainland are in unplanned/ unclassified areas.

For the Kootenay-Boundary region the zoning data in this report are based on the 1995 Kootenay-Boundary Land Use Plan (KBLUP). There have been some revisions to this zoning in the 1997 KBLUP Implementation Strategy and the 2000 Higher Level Plan. For example, while ERZs account for less than 1% of the Kootenay-Boundary region in the KBLUP, the Higher Level Plan provides for intensive forest management in some substantial Enhanced Resource Development Zones in the Nelson Forest Region. In addition, the evolving land use plan for the Kootenays is de-emphasizing the original zonal objectives/ strategies in favour of a Resource Management Guidelines approach that emphasizes managing for values wherever they might occur on the land base.[1]

The table on the page following lists the regions for which SLUPs were completed as of March 31st, 2001 and provides the breakdown of each planning area by type of zone. The following observations can be made from the table:

- From 1992 to March 31, 2001, some 12.5% of British Columbia has been protected from resource development (excluding the PAs designated as part of the Central Coast and Lillooet agreements). This includes 5.6% that was originally protected prior to 1992, 4.9% that was protected through SLUPs and 2.0% that was protected through the PAS independent of SLUPs. Protected areas comprise 13.0% of the SLUP planned areas.

- The region with the highest percentage of new SLUP PAs is Mackenzie with 10.6% of the area in new PAs followed by Fort Nelson (9.2%), Cassiar-Iskut (8.8%) and Kispiox (8.8%). Four regions already had high percentages of PAs prior to SLUPs. These include Cassiar-Iskut (Spatsizi Plateau Wilderness Park/ Tatlatui Park and Mt. Edziza Park), Kamloops (Wells Gray park), Lakes (part of Tweedsmuir Park) and the Robson Valley (Mount Robson Park).

- SMZs cover 16.4% of B.C. and 22.6% of total SLUP area. The planning area with the greatest incidence of SMZs is the Cassiar-Iskut region at 43% of the total area, but in that region some of the constraints applied to each zone are relatively minor (for example, some of the polygons only cite a single wildlife objective and specify that mining and other resource interests can continue as in general zones). The region with the second greatest incidence of SMZs is the Mackenzie region at 38.8%, mainly due to the Muskwa-Kechika (M-K)/ Northern Rockies Management Area. The M-K region covers 6.3 million hectares of special management and protected areas across the three planning regions (Fort St. John, Fort Nelson and Mackenzie).

- ERZs cover 22.5% of SLUP planned areas, or 15.9% of the province. The regions with the highest percentage of ERZs are Vanderhoof (56.4%), the Cariboo-Chilcotin (43.5%), Fort Nelson (37.4%) and Prince George (35.9%). Other regions that chose to designate ERZs all allocated at least 20% of the planning area to ERZs except for the Kootenay-Boundary region. In that region, only 0.9% of the area was designated as ERZ, mainly to preserve coal mining values (as noted earlier, the Higher Level Plan subsequently established some significant Enhanced Resource Development Zones for forestry in the Nelson Forest Region).

---

[1] Based on discussions with MSRM staff, October 2001.

The table provides a breakdown of protected areas into new SLUP PAs, new non-SLUP PAs and original PAs. Some 906,000 hectares of the PAs or 7.6% of the total PAs of 11.9 million hectares consisted of upgrades from Recreation Areas or Forest Wilderness Areas to Class A Provincial Parks (approximately 25 areas). Approximately half of the 906,000 hectares were classified as new protected areas (SLUP and non-SLUP) and the other half were classified as "original PAs" in the data supplied for this analysis. Some examples are the Upper Stikine Spatsizi Extension, which was considered a new PA; Skagit Valley, which was split between the new PA and original PA categories; and the Gitnadoxi watershed, which was allocated entirely to "original PAs".

Table 1 List of SLUP Area and Percentage of Area by Type of Zone

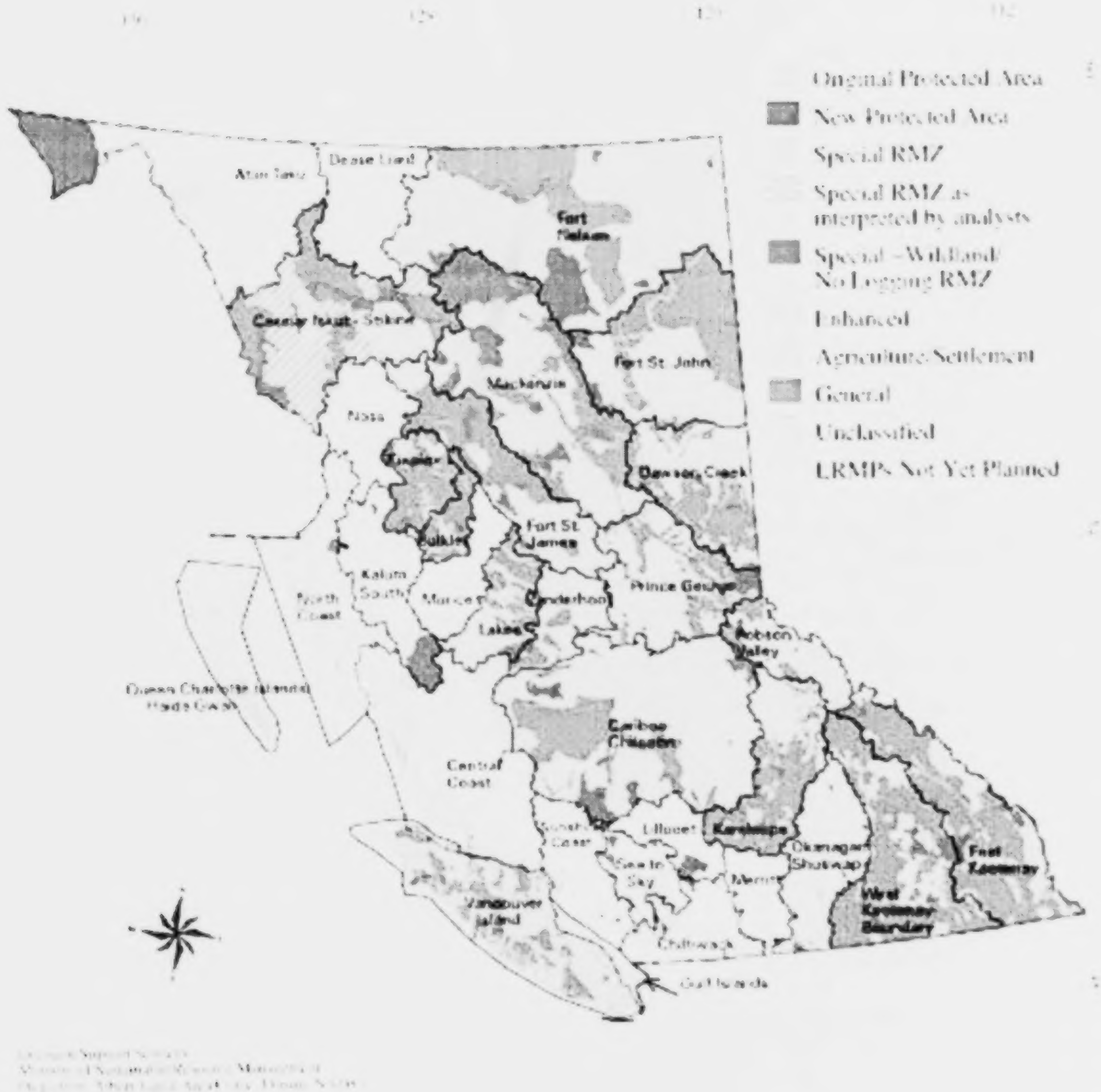
Plan Area	Total Area (million ha)	% of Area by Zone (PAs, SMZs and Enhanced)							Agri. Settle-ment Private	General Unclas-sified	Total
		New SLUP PAs	New non-SLUP PAs	Original PAs	Total PAs	SMZs Excl. No Logging	SMZs - No Logging/ Wildland	En-hanced			
Fort Nelson	9.8	9.2%	0.0%	1.5%	10.8%	28.5%	0.0%	37.4%	0.0%	23.3%	100%
Cariboo-Chilcotin	8.4	5.8%	2.8%	3.5%	12.0%	25.4%	0.0%	43.5%	0.0%	19.1%	100%
Kootenay Boundary	8.2	6.5%	0.0%	7.4%	13.9%	15.6%	0.0%	0.9%	1.8%	67.8%	100%
Mackenzie	6.4	10.6%	0.0%	3.4%	14.0%	21.3%	17.5%	28.7%	0.4%	18.1%	100%
Cassiar-Iskut	5.2	8.8%	0.0%	17.5%	26.3%	39.5%	3.7%	0.0%	0.0%	30.5%	100%
Fort St John	4.7	4.4%	0.0%	0.1%	4.4%	18.1%	0.0%	19.9%	11.9%	45.7%	100%
Prince George	3.4	7.5%	0.1%	0.8%	8.4%	18.8%	2.5%	35.9%	11.4%	23.1%	100%
Vancouver Island	3.4	3.3%	1.4%	8.4%	13.1%	8.0%	0.0%	24.1%	23.8%	30.9%	100%
Fort St James	3.2	5.9%	0.0%	0.1%	6.0%	16.4%	0.0%	32.0%	0.5%	45.1%	100%
Dawson Creek	2.9	5.3%	0.0%	1.6%	6.9%	12.9%	0.0%	22.3%	13.3%	44.6%	100%
Kamloops	2.8	3.9%	0.0%	18.7%	22.6%	18.9%	0.0%	0.0%	0.7%	57.8%	100%
Okanagan	2.4	5.0%	0.0%	2.9%	7.9%	0.0%	0.0%	0.0%	15.0%	77.1%	100%
Lakes	1.6	6.7%	0.0%	27.8%	34.5%	19.3%	0.0%	0.0%	7.8%	38.4%	100%
Robson Valley	1.5	4.9%	0.0%	15.3%	20.2%	25.3%	0.0%	30.8%	4.8%	19.0%	100%
Vanderhoof	1.4	6.7%	0.0%	0.1%	6.8%	3.9%	0.0%	56.4%	14.7%	18.1%	100%
Kispiox	1.2	8.8%	0.0%	0.0%	8.8%	18.3%	0.0%	0.0%	2.8%	70.1%	100%
Bulkley	0.8	5.2%	0.0%	0.0%	5.2%	11.5%	8.7%	0.0%	9.0%	65.6%	100%
TOTAL SLUP AREAS	67.3	6.9%	0.4%	5.6%	13.0%	20.6%	2%	22.5%	4.8%	37.0%	100.0%
Lower Mainland	0.8	0.0%	24.3%	48.3%	73%	27.4%					100.0%
Unplanned Areas	26.6	0.1%	5.4%	4.1%	9.6%	0.0%	0.0%	0.0%	0.0%	90.4%	100.0%
TOTAL PROVINCE	94.7	4.9%	2.0%	5.6%	12.5%	14.9%	1.5%	15.9%	3.4%	51.7%	100.0%

Notes:

1. Regions are sorted by size. Totals may not add due to rounding.
2. The area for each SLUP region sometimes varies slightly from one report table to the next depending on the data source. However, the differences are inconsequential.
3. SLUP areas exclude the results from the Kalum South (agreement reached in December 2000), Central Coast and Lillooet LRMPs (as well as any other agreements reached after March 31, 2001).
4. The Kootenay Boundary statistics are based on the 1995 Kootenay Boundary Land Use Plan, which has been superseded in some respects by the 2000 Higher Level Plan.

Source: Based on data from Land Use Coordination Office (LUCO). Appendix 1 provides more detail.

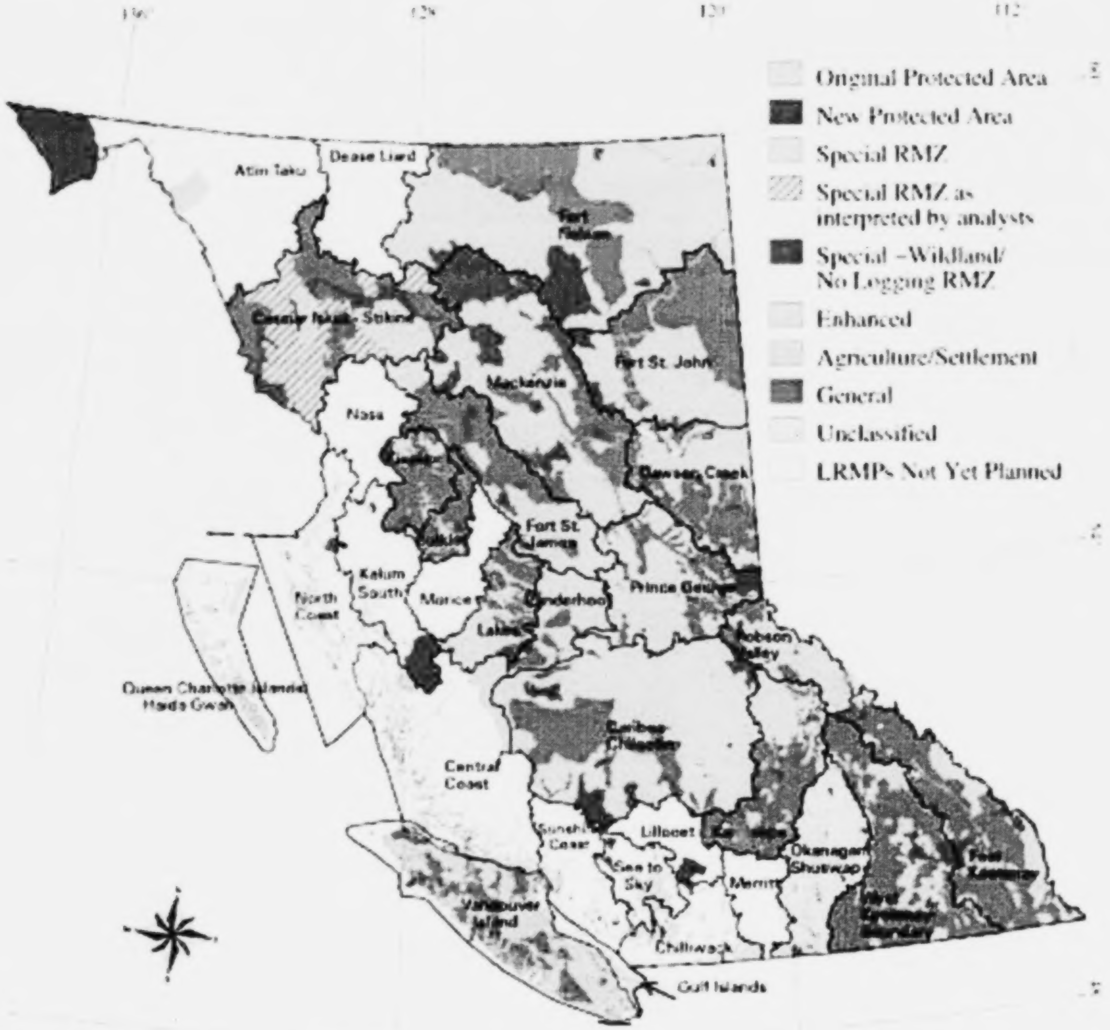
The following page shows a map of Resource Management zones in B.C. as described in Table 1.


Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
Enhanced
Agriculture/Settlement
General
Unclassified
LRMPs Not Yet Planned
Atlin Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Mackenzie
Fort St. John
Nass
Dawson Creek
Fort St. James
Bulkley
Kalum South
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands/ Haida Gwaii
Cariboo Chilcotin
Central Coast
Kamloops
Lillooet
Sunshine Coast
Sea to Sky
Okanagan Shuswap
East Kootenay
Merritt
West Kootenay Boundary
Vancouver Island
Chilliwack
Gulf Islands

Resource Management Zones in BC
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from
Stuart Gale & Associates Ltd.
and BriMar Consultants


Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
Enhanced
Agriculture/Settlement
General
Unclassified
LRMPs Not Yet Planned
Atlin Taku
Dease Liard
Fort Nelson
Cassiar Iskut-Stikine
Fort St. John
Mackenzie
Nass
Dawson Creek
Fort St. James
Kalum South
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands/ Haida Gwaii
Cariboo Chilcotin
Central Coast
Sunshine Coast
Lillooet
Kamloops
Okanagan Shuswap
Sea to Sky
Merritt
Vancouver Island
Chilliwack
Kootenay Boundary
East Kootenay
Gulf Islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum NAD83

Resource Management Zones in BC
January 2001

3. Impact Assessment: Industrial Sectors

3.1 *Forest Industry*

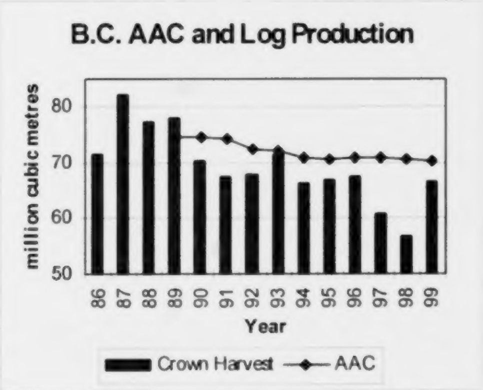
3.1.1 Overview of the B.C. Forest Industry

B.C.'s forest industry is the largest single goods producing contributor to provincial GDP. The forest sector accounts for 23% of B.C.'s goods producing industries, which in turn account for 26% of the total provincial GDP.[2] The B.C. forest sector generates 90,600 direct Full-Time-Equivalent jobs (FTEs) and at least twice as many indirectly through suppliers of goods and services.[3]

The B.C. forest industry is accustomed to forest product market cycles causing temporary setbacks in production and profitability. However, various factors affecting the B.C. forest sector over the last decade have resulted in economic restructuring that has impacted many of the B.C. rural communities that rely on forest sector activities. Some of the key factors affecting the industry are listed following.

- **Drop in Allowable Annual Cut (AAC).** The AAC dropped by 4.2 million m3, or 5.6% between 1989 and 1999, enough wood to supply 11 medium sized sawmills. In the past few decades, the AAC was set at higher levels for first pass harvesting to reflect the fact that older forests contain more wood than younger forests. As timber harvesting in B.C. moves into second-growth forests, the AAC in many areas of the province will continue to decline, even though the area harvested may not change significantly (the 'falldown' effect).

  The provincial AAC is an aggregate of the AACs determined for 34 tree farm licenses (TFLs) and 37 timber supply areas (TSAs). The provincial AAC also combines the conventional coniferous sawlog component of the AAC with the AAC for lower value stands such as deciduous (hardwood) timber, insect-attacked stands and marginally economic stands. The Chief Forester sets the AAC for each TSA and TFL at least every five years, after conducting a thorough Timber Supply Review (TSR) for each area.



Source: B.C. Ministry of Forests data as reported by PriceWaterhouseCoopers, 1999.

- **Declining Harvest from Crown Land**. The harvest from crown lands peaked in 1987 at 82.3 million cubic metres and was at its lowest in 15 years in 1998 at 56.8 million cubic metres. In 1999, the harvest increased to 66.7 million cubic metres or 95% of the AAC. In 1999, the undercut was approximately 10% on the Coast and 4% in the Interior (with cut-control flexibility licensees can harvest within 50% of their AAC in any given year but must harvest within 10% of their AAC over a five year period).

---

[2] Includes Gross Domestic Product (GDP) for logging and forestry, wood manufacturing and paper and allied industries. Goods producing industries account for 26% of the total provincial GDP of $86.0 billion (factor costs, $1992 dollars, 1997). The BC forest industry accounts for 6% of the total GDP. Source: *BC Economic Accounts for 1997*, BC Stats based on Statistics Canada data.

[3] Source: PriceWaterhouseCoopers, *The Forest Industry in British Columbia, 1999.*

- **Lower Average Quality of Timber**. The drop in the conventional coniferous sawlog component of the provincial AAC has been much more severe than the decline in total AAC. For example, in the TSR that took place between 1992-1996 (TSR-1), the AAC declined by 3.5 million m3 for coniferous sawlogs but it increased by 3.1 million m3 for deciduous, insect-attacked stands and marginally economic stands. The net result is a decline in the percentage of higher value timber in the AAC from 94% pre-TSR-1 to 89% post-TSR-1. The low harvest levels of 1998 were partly the result of a lower average timber quality in the AAC. With the lower product market prices experienced in 1998, it was particularly difficult to harvest marginally economic forests profitably. The lower average quality of timber was noted in a 1997 Ministry of Forests publication: "This change in the quality of the AAC has major implications for the existing timber processing industry. Some operations will have to retool in order to process different species, smaller size material or poor quality of wood. In addition to the costs of reinvestment, the cost of harvesting in marginally economic forests is often higher due to difficult terrain and access difficulties, and the value of the final products is typically lower."[4]

  Certain regions of the province have been particularly affected by the decline in the AAC. For example, the AAC for coniferous and deciduous for the Vancouver Forest Region declined 6% (from 21.6 million m3 to 20.3 million m3) in TSR-1 and another 2.9% for the 8.9 million m3 that have been reviewed so far as part of TSR-2. The Nelson Forest Region has also been particularly affected with a 9% drop in the AAC in TSR-1 (from 6.05 million m3 to 5.5 million m3) and another drop of 0.8% for the 3.1 million m3 in volume that has been reviewed so far in TSR-2. Appendix 2 provides more detail on the impacts of the Timber Supply Reviews (TSR-1 and TSR-2) on the AAC for each TSA and TFL.

- **Forest Practices Code (FPC) and Increase in Logging Costs**. In 1995, the B.C. government enacted the FPC, which prescribes respect and provision for all values of the forest, including timber, fish, wildlife, water quality, biodiversity, soils, recreation and culture. There are substantial incremental logging costs associated with the FPC. For example, in 1997, PriceWaterhouseCoopers reported that road costs almost tripled between 1992 and 1997 (from $263 million in 1992 to $761 million in 1997) mainly due to the additional roads required to meet the Forest Practices Code adjacency rules, smaller cut blocks, and higher road building and maintenance standards under the Code.

  B.C. logging costs have increased in recent years, partly as a result of the Forest Practices Code and partly due to the fact that harvestable timber is, on average, less accessible. Average delivered timber costs on crown lands increased from $48 per m3 in 1992 to $75 per m3 in 1999, a 56% increase (costs peaked in 1997 at $88 per m3).

- **Stumpage Rate Increase.** In 1994, the B.C. government made changes to stumpage rates. Stumpage fees paid by industry have increased from $616 million in 1992 to $1.4 billion in 1999 (stumpage fees peaked in 1995 at $1.8 billion). The increase in stumpage fees explains approximately $10 per m3 of the increase in the cost of timber delivered from crown lands.

---

[4] Source: *1992-1996, Summary of Timber Supply Review Results (TSAs and TFLs)*, B.C. Ministry of Forests, 1997.

- **Volume Quotas on Lumber Exports to U.S.** Between 1996 and 2001, B.C. has had a volume quota on lumber exports to the U.S. of 8.5 billion board feet. In the past, B.C. lumber producers have shipped as much as 9.2 billion board feet of lumber to the U.S. during strong markets.[5] Partly due to the volume quotas on lumber exports, B.C.'s softwood lumber production declined by 1.1 billion board feet from 1996 to 1998 (during that same period, Eastern Canada increased its lumber production by 1.1 billion board feet and lumber production also increased in the U.S.). Since the expiry of the Canada-U.S. softwood agreement in March 2001, U.S. lumber producers have commenced various trade actions against Canadian softwood lumber producers.

- **International Market Pressures and Forest Certification**. The forest industry has been under pressure from international environmental groups to adopt better harvesting practices, as the tactics of many of these groups moved from "valley to valley confrontation" to market place boycotts and protests. Certification is a voluntary measure to show customers that purchases are from well-managed forests. There are three widely quoted standards:

  - ISO 14 001 by the International Organization for Standardization: ISO 14 001 assesses a company's environmental management system. It does not measure forest practices directly and does not necessarily require that all the activities of a forest products organization be certified. As a result, it is typically not judged sufficient by environmentalists.

  - CSA Z809 by the Canadian Standards Association: The CSA measures on-the-ground performance against standards designed to ensure good forest management.

  - FSC by the Forest Stewardship Council, an international certification organization based in Mexico. As with the CSA, this measures forest practices against a set of forest management standards. FSC requires that each stage of production, from logging to distribution be subject to strict environmental standards. As a result, FSC offers a seal that certifies that a product originated from a FSC certified forest. Home Depot, the large U.S. retailer of lumber products is committed to selling only certified products by the year 2002, and so far, the certification of choice is the FSC certification.[6]

- **Continuing Low Profitability in the B.C. Forest Industry.** Partly as a result of the structural changes affecting the industry and partly due to cyclical trends, the profitability of the B.C. forest industry has been consistently below the rate of return on Canada Savings Bonds. Even though the industry returned to profitability in 1999, earning 7.6% on capital employed, the 5-year average was 2.9%, or less than the 4.4% that would have been earned over the same period on risk free investments.

- **Expropriation/ Compensation**. There have been a number of cases where Protected Areas have encroached on the B.C. forest industry' s timber harvesting rights. Some of the most well known include[7]:

  - The settlement with Doman Industries late in 1991 for timber rights lost in the creation of the

---

[5] B.C. lumber shipments were 9.2 billion in 1987 and 1988, Council of Forest Industries Fact Book.

[6] Based on various issues of *The Forest & The People*, Forest Alliance of B.C., Spring 1999, Summer 1999 and Summer 2000 issues.

[7] Source: Brimar Consultants, based on Ministry of Forests and other data. Also, Hunter, Justine, *Claims for Lost Timber Rights Could Cost B.C. $200 Million*, The Vancouver Sun, September 24th, 1997.

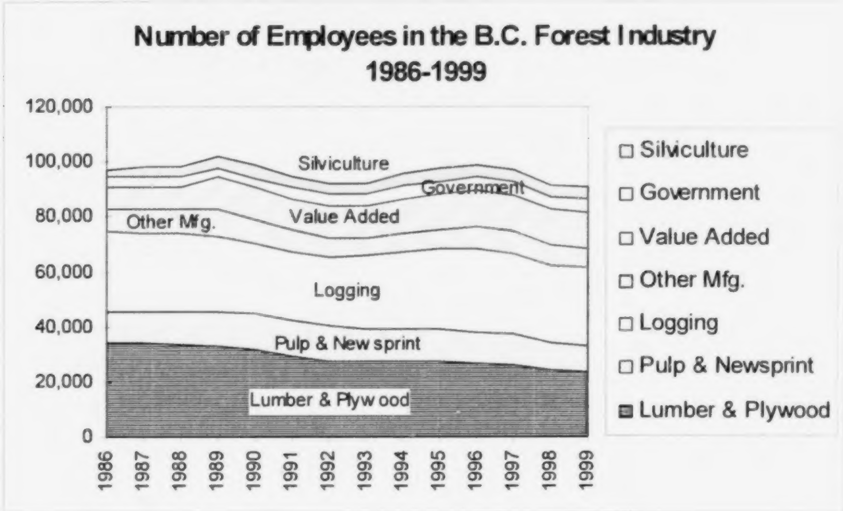
South Moresby/Haida Gwaai National park reserve in the Queen Charlotte Islands ($37 million dollars).

- Also in South Moresby, a 1993 settlement with MacMillan Bloedel for the loss of 5 timber licenses for $9.8 million (included interest and approximately $15 per m3 as at January 1989, on 416,000 m3).
- The 1999 settlement with MacMillan Bloedel for $83.75 million for loss of forest tenures in the Clayoquot, Strathcona, Carmanah-Walbran, Lower Tsitika and Tahsish-Kwois areas.

Many of these factors have exerted pressure on the forest sector throughout the 1990s. However, the impacts were hiding behind relatively strong product markets in 1993, 1994 and 1995. Between 1996 and 1998, however, weakening product prices, the downturn in the Japanese economy and trade restrictions in the U.S. exposed the severity of the structural problems and led to the closure of several mills throughout B.C. In certain forest dependent communities, the impacts were devastating. For example, Gold River lost 42% of total employment in the community and 54% of employment income.

Nevertheless, the forest industry in B.C. continues to be a very important economic contributor, particularly for rural communities across the province. While employment dropped significantly between 1990 and 1992, most of the drop was regained in the mid 1990s and employment was almost back to 100,000 direct jobs by 1996. Employment dropped again in 1998 and while some gains are expected for 1999/2000, employment is not expected to reach previous peak levels in the near future.

While employment is down from the peak, the total jobs in 1999/2000 are at approximately the same level as in 1990, despite a drop in the AAC of 4.2 million m3. There has been a shift in employment, however, with fewer jobs in lumber, plywood, veneer and pulp and paper production but more in logging and value-added operations (logging includes all activities related to harvesting such as road building, harvesting and harvest planning).


Number of Employees in the B.C. Forest Industry 1986-1999

Source: PriceWaterhouseCoopers

Key economic impact variables are provided in the following table.

Table 2 Key Economic Variables for the Forest Industry, 1999

	Total – 1999 Data[1]	Per m3 of Wood Harvested
Harvest:	(millions of m3 of wood)	

• Crown land	66.7	
• Private	8.9	
Total	75.6	
Direct employment and wages[2]		
• Primary employment	56,900	0.753 PYs/000 m3 harvested
• All employees	90,600	1.198 PYs/000 m3 harvested
• Average wages and benefits	$67,042	
Sales revenues net of by-products consumed in B.C. (mainly chips)	($ million) $18,158	$240.2 per m3 of wood harvested
Government revenues:	($ millions)	
• Stumpage, royalties, rent	$1,403	$21.03 per m3 of crown wood harvested
• Other industry payments	$1,059	$14.01 per m3 of all wood harvested
Total	$2,462	

Notes:

1. 1999 was a much better year than 1998, but 1998 was an especially dismal year for the B.C. forest industry. Over the last five years, 1999 can be considered an average year. By comparison, the five year average (1995-1999) for stumpage, royalties and rent was $1.624 billion, the average number of employees was 95,170, net sales revenues were $16.6 billion and the average log harvest was 72.14 million cubic metres.
2. Other industry payments to governments include corporate income tax, sales taxes, property taxes and capital tax. These exclude the $1.4 billion in employee income tax deductions and their CPP and UIC contributions.
3. Primary employment includes logging and forestry and primary wood processing. All employees include primary employment, value-added, pulp and paper and MOF government employees.

Source: Based on data from PriceWaterhouseCoopers, *The B.C. Forest Industry in British Columbia*, 1999.

3.1.2 Base Case Assumptions

The B.C. forest industry has faced many challenges in the last decade including declining access to crown timber, pressures to improve harvesting practices, increases in logging costs, trade barriers to the U.S., international market pressures and forest certification. The 4.2 million m3 drop in the AAC has led to a decline in sawmilling and pulp and paper employment, although some of that decline has been countered by growth in the logging and forestry sector and the value-added sector.

In this very dynamic environment, it is difficult to isolate and measure the specific impacts of SLUPs and the PAS. Most of these challenges were quite independent of SLUPs and the PAS. The fall-down effect, the Forest Practices Code (FPC), trade issues with the U.S.A., cyclical trends in market prices and international pressures and boycotts for better environmental practices are all included in the "Base Case".

Without SLUPs or the PAS, there would probably have been other land use planning initiatives such as occurred in Clayoquot Sound, and the type of initiatives currently underway in the Central Coast. Some of the areas protected under PAS would likely have been protected in a manner similar to Clayoquot Sound and the Stein Valley, two areas that were protected largely outside of strategic land use planning processes.

Determining the "Base Case" for the forest sector means determining how the forest sector would have developed and what the future prospects would be had there been no SLUP initiatives and no PAS. This is a very difficult task and involves forecasting what PAs and other land use designations would have prevailed without SLUPs, and how the various stakeholders would have reacted to ongoing land use conflicts. Rather than attempt this, this study considers the Base Case to be the situation that prevailed in 1991 prior to the PAS and SLUPs. As a result, this study attributes the full impacts of all land use designations after 1991 to those two initiatives. It also attributes any perceived changes in land use conflict, land use efficiencies, resource inventories, stakeholder communication, etc. to those two initiatives.

The types of questions to be answered in arriving at the impacts of the PAS and SLUPs include:

- Were any existing operations affected by SLUPs or the PAS?
- Were any investments affected by SLUPs or the PAS?
- Were areas with high timber values affected by SLUPs or the PAS?
- Was land use certainty affected by SLUPs or the PAS?
- Were the incidence or intensity of land use conflicts affected by SLUPs or the PAS?
- Did SLUPs or the PAS help the forest products certification process?
- Were the overall operating environment and prospects for the forest sector affected by SLUPs or the PAS?

The next sections present a combination of quantitative and qualitative data to frame the magnitude of the impacts of SLUPs and the PAS on the B.C. forest sector.

3.1.3 Quantitative Data on Forest Industry SLUP Impacts

The difficulties in assessing the impacts of SLUPs and the PAS on the forest industry are compounded by the complexity of measuring the impacts on timber volumes available and feasible for harvest. In B.C., volume available for harvest from crown land is expressed as the Allowable Annual Cut (AAC) and the Long Term Harvest Level (LTHL). The LTHL may be defined as the timber harvesting level whereby the volume of timber harvested in any given period can be replaced by a similar volume from regenerated stands within the same period. The following briefly outlines some of the factors that come into play when assessing the AAC and LTHL for a specific TSA or TFL.

- **Timber Harvesting Land Base** which is affected by changes in operability, accessibility, harvesting and processing technology, market values, species preferences, and resource management objectives.

- **Existing Forest Inventory,** which is affected by improvements in measurement techniques, accumulated inventorying effort, harvesting and natural disturbances, insect and disease impacts and silviculture treatments.

- **Expected Rate of Growth,** which is affected by improvements in growth measurement, improvements in silviculture, and reforestation effort.

- **Utilization Standards,** which define the species, dimensions and quality of trees that must be removed from an area during harvesting.

- **Integrated Resource Management Objectives,** which constrain harvesting activities through various requirements concerning cutblock adjacency and green-up, visually sensitive areas, recreation values, cultural heritage resources, community and domestic watersheds, riparian areas, wildlife habitat, biodiversity, and fire-maintained ecosystem restoration.

- **Economic and Social Objectives,** which are to be considered as part of the AAC determination in order to minimize the economic and social disruptions as much as possible, without compromising the LTHL.

Most of these factors affect the AAC determinations and the LTHL. However, whereas the AAC determinations are heavily influenced by the Chief Forester's judgement in balancing short and long term objectives, the LTHL is more of a pure calculation based on a set of assumptions. Most areas of the province have begun to make 'falldown' adjustments in the rates of timber harvest which are necessary to move from harvesting primarily old, unmanaged forests, to rotation harvesting of managed, regenerated forests.

When reviewing the quantitative data, the following caveats need to be kept in mind:

- Tracking changes in the AAC for areas which have undergone strategic land use planning is not a good indicator of the impacts of the planning initiative. The complexity of the AAC determination process does not allow for the isolation of SLUP impacts due to the many factors that affect the AAC and that can change between consecutive AAC determinations for a given area (typically 5 years apart). Also, the impacts of new PAs and more restrictive forest cover constraints can often be deferred, allowing harvesting to continue at the same rate, with the key impact being that fall-down is reached sooner.

- LTHLs are most influenced by changes in the THLB and changes in integrated resource management (IRM) objectives. The SLUPs can prompt both types of changes through the designation of protected areas (impacts THLB), and Special (SMZ) or Enhanced (ERZ) resource management zones (impacts THLB and IRM)).

- Charting the measured THLB for a particular area before and after an SLUP is implemented might give some insight into the SLUP impacts but as with the AAC determination, there are many other factors that influence the measured timber harvesting land base that can change between TSRs. For example, between the TSR-1 and TSR-2, the THLB for the Fort Nelson area increased by 34% from 707,900 hectares in 1992/1993 to 925,000 hectares in 2000.[8]

- Removing portions of the THLB for protected areas, or imposing harvesting constraints on portions of the THLB to achieve non-timber resource management objectives, can alter the mix of species available for harvest as well as the average age and quality of the timber harvested.

- The THLB status of any given tract of land can change over time for a variety of reasons (operability, accessibility, harvesting and processing technology, market values, species preferences, resource management objectives, etc.) and its status at any point in time is not necessarily reflective of any long term status.

- Special Resource Management Zones (SMZs) have been designated where non-timber values (i.e. wildlife habitat, recreation, visual quality, ecology, soil sensitivity, water quality and commercial hunting, fishing, or guiding) have special significance and special resource management objectives have been identified. There is a wide range of implied or specified operating restrictions for forestry across the various types of SMZs, both within individual plan areas and across the province. In many areas the management guidelines appear to fall within the measures that would be, in any event, required under the forest practices code.

---

[8] B.C. Ministry of Forests, *Fort Nelson Timber Supply Area Public Discussion Paper*, March 2000.

- SLUPs could affect several elements of harvesting costs including road building costs (more roads for smaller cutblocks, longer roads to avoid protected areas), costs related to different harvesting techniques (prescribed to protect other resource values), terrain related costs (steeper hillsides versus flatter valley floors), harvesting plan development costs and harvesting plan approval costs.

Three broad sources of quantitative data have been examined for indications of the impacts of SLUPs and the PAS on the forest sector. These include:

- The Socio-Economic Analyses (SEAs) undertaken for each of the SLUPs and the AAC determination reports for those areas of B.C. where SLUPs have been completed or are sufficiently advanced to allow the Chief Forester to consider the SLUP impacts in the TSR.

- Qualitative and quantitative assessments by Ministry of Forests regional staff of the impacts of SLUPs on the Timber Harvesting Land Base (THLB).

- Provincial coverage GIS data assembled by LUCO on productive forestlands and mature forest cover, analysed and mapped by SLUP zoning designation.

3.1.4 Forest Industry Impacts Noted in the Socio-Economic Analyses for SLUPs

All of the Socio-Economic Analyses (SEAs) conducted as part of the SLUP process address the impacts of proposed SLUPs on the forest sector in each region of the province, albeit in various degrees of detail. A review of the SEAs yields the following observations:

The assumptions underlying the Base Case in each planning area differ significantly between planning areas, partly as a result of when the analysis was completed. With some of the later analyses, estimates were made of the land use regime that would most likely prevail in the absence of the SLUPs, often including the impacts of PAS as part of the Base Case:

- The SEAs of the CORE plans (Cariboo-Chilcotin, Vancouver Island and West/East Kootenay) were completed in 1994 and they include the impacts of the Forest Practices Code (FPC) as part of the SLUP impacts (The FPC was enacted in 1995).

- The LRMP SEAs consider the FPC impacts to be part of the Base Case, however, the PAS is not treated the same in all regions. The SEAs for the first LRMPs such as Kamloops and Kispiox (completed in 1993 and 1992, respectively) as well as others in the mid 1990s excluded the PAS from the Base Case. Seven of the eight LRMPs in the Prince George Forest Region included the PAS as part of the Base Case (e.g. Bulkley (1996), Dawson Creek (1999), Fort St. James (1998), Fort St. John (1998) and Vanderhoof (1998)), mainly because the B.C. government provided specific percentage PA targets to these LRMPs.

- In some of the regions, such as the Fort Nelson TSA, the SEA estimates what land use zoning would likely occur without the LRMP. In Fort Nelson, the Base Case includes the PAS but also some SMZs, ERZs and General Zones, although in different configurations than in the LRMP scenario.

The SEAs often assess the potential for mitigation strategies, usually as a result of MoF

carrying out timber supply modelling that demonstrates the possibility of deferring impacts on AAC without compromising the long term harvest level.

The SEAs for the 1994 CORE plans attempted to estimate the short term impacts of timber supply withdrawals due to new PAs and RMZs, by assuming that the percentage reductions in annual crown harvest were equal to the percentage withdrawal of mature timber supplies. Thus, for the Cariboo-Chilcotin, it was estimated that the SLUP would likely result in a decline in crown timber supply of 12.7% and a decline in total regional harvest (crown and private) of 9.9%. These estimates were based on the assumption that the impact of PAs and RMZs on mature forest available for harvest would approximate the impact on the current harvest. Employment and revenue losses were then calculated based on the assumed harvest reductions. The CCLUP identified mitigation strategies but the net impacts on annual harvests, employment and revenues of those strategies were not assessed. A similar approach was used for the Kootenay and Vancouver Island plans.

By contrast, most of the LRMPs had the benefit of MoF timber supply modelling, which due to the amount of mature timber in most TSAs demonstrated to LRMP tables that timber supply impacts could be deferred, often for one or more decades as per MoF policy, even though this would accelerate the fall-down effect to some degree. The following lists some examples:

- The Prince George TSA is comprised on three Forest Districts, but AACs are set at the TSA level, not the District level. Since each District had an LRMP, MoF undertook timber supply modelling for each District/LRMP. In the Prince George TSA, the SEA reported that the LRMP would likely result in a drop in the AAC in the Prince George District but that this drop could be compensated by AAC increases in the Fort St. James and Vanderhoof districts, thereby limiting the negative SLUP impacts on existing sawmilling and other processing facilities. Overall, with these reallocations, the SEAs and MoF modelling concluded that at the TSA level, the current AAC would be maintained for approximately 25 years. The SEAs in Fort St. James and Vanderhoof mention that these reallocations would restrict growth in the Vanderhoof and Fort St. James districts, although the SEAs do not provide estimates of the magnitude of this impact.

- The SEA for the Okanagan-Shuswap LRMP forecasts no SLUP impact on timber supply volume for 80 years. The SEA also reports, however, that the SLUP would result in a reduction of 40,461 hectares in the THLB, which would likely force a transition from natural stands to managed stands some 80 years from now, instead of in 100 years under the Base Case.

- The SEA for the Bulkley region reports that the main impact of the plan would be to lower the LTHL by 10%, 14 decades from now. There would likely be no impact for decade 1 and very small impacts for the next 5 or 6 decades.

- The MoF timber supply modelling done for most other SLUPs also indicates that AAC impacts can be deferred for several years or decades, even though that would mean reaching the LTHL sooner. For example, the MoF analysis concludes that SLUP impacts can be deferred for 10 years in Kispiox, 25 years for Lakes, 35 years for Mackenzie, and 30 years for Dawson Creek.

Some of the SEAs note that the plans have led to a more efficient use of resources, thereby mitigating the negative impacts on timber supply of withdrawing some of the THLB for PAs:

- In the Kamloops region, the SEA recognizes the negative impacts on the level of cut due to the capture of THLB in the new PAs, however, the SEA also reports that through better planning, the

Ministry of Forests was able to better manage for non-timber values, which then counterbalanced the negative effects on the AAC. The SEA for Kamloops reports very minor impacts on current harvest levels: the plan may result in a net decline of between 8,000 m3 and 17,000 m3 on an AAC of 2.3 million m3, after accounting for the possible AAC increase of 55,000 m3 through other plan recommendations.

- In the Okanagan-Shuswap, a review of biodiversity requirements as part of the LRMP succeeded in achieving biodiversity requirements on non-THLB lands, thereby reducing the overall impacts of the plan.

The SEAs often mention that the plans may lead to increases in forest management costs and harvesting costs due to additional constraints resulting from the plans and in particular, the SMZs specified in each plan. The SEAs, however, do not speculate on the impacts these higher costs might have on harvest levels.

The SEAs conducted for CORE recognized the impacts of additional RMZ constraints on timber supply and harvest reductions, but the CORE plans included the impacts of the FPC as part of the impacts of the plan. The SEAs for CORE did not assess the impacts of the proposed plans on harvesting costs.

The SEAs for the LRMPs consider the FPC as part of the Base Case and they do not assess the impacts of additional SMZ constraints on timber supply and harvesting costs. The B.C. forest industry continues to harvest at levels below the AAC, which may be partly due to higher harvesting costs. However, there are many other reasons for the lower harvest levels including trade disputes with the United States and weak market conditions.

Some of the SEAs recognize that some of the plan restrictions can make it more difficult for licensees to identify sufficient areas available for harvest of the full AAC. For example, the Lower Mainland SEA for the Protected Area Strategy notes that the assessment may not reflect the "full impact of licensees having on the ground difficulties of finding alternative harvesting areas". [9]

The SEAs tend to focus on the impacts on existing operations rather than foregone opportunities.

The crown harvest in B.C. peaked in 1987 at 82.3 million m3. In many regions of the province including Coastal B.C. and the southern interior, harvest levels and the AAC are either expected to remain the same or decline over the next decades. For those regions, the SEAs for the plans focus on existing operations and current harvest levels.

There are however, some more remote regions in B.C. where the timber is less accessible and where the AAC has not been reached. For those regions, reducing the THLB affects future opportunities but because the industry in those regions is not yet developed, these opportunities are very uncertain. For example:

- In the Cassiar-Stikine TSA, the AAC is set at the LTHL of 400,000 m3 but very little commercial logging takes place in that region. As a result, it is very difficult (and not done in the SEA) to forecast what the impacts might be of a relatively small decline in the LTHL many decades from now.

---

[9] Holman, Gary, *Socio-Economic Evaluation of Lower Mainland Protected Areas proposed by Regional Public Advisory Committee*, 1996.

- In the Fort St. John TSA, the current AAC of 1.1 million m3 for coniferous timber is smaller than the LTHL of 1.8 million m3. The SEA shows that the SLUP will result in a 28% decline in the LTHL to 1.3 million m3, but this remains higher than the current AAC. Again the SEA mentions that this will mean foregone opportunities but the uncertain nature of these opportunities makes it impossible to assess what might be the employment and other economic consequences.

The same issue applies to the AAC reduction deferrals in the Prince George TSA. To mitigate the fall-down in the Prince George Forest District, the MoF re-allocation process results in more harvesting in Vanderhoof and Ft. St. James. The SEAs mention that these latter two Districts might lose opportunities as a result of more of the harvest in those areas being destined for Prince George, but the SEAs focus on the fact that, consistent with MoF policy, the current harvest in those Districts would be maintained for at least 25 years.

In regions where the AAC is expected to decline due to the TSR and 'falldown' effect, the SLUP impacts are more severe and cannot be as easily mitigated.

The drop in AAC has been most significant in Coastal B.C. and in the Kootenay region (TSR-1 reduced the coniferous AAC by 11.7% in the Nelson Forest Region, by 9.3% in the Vancouver Forest Region and by 6.8% in the Prince Rupert region; in the other B.C. regions the coniferous AAC dropped by 1% or less.

In the regions most affected by the TSR and "falldown" effect, there are fewer opportunities to maintain the AAC at current levels and mitigate the negative impacts related to PAs. As a result, the SEAs tend to highlight the timber supply constraints in those regions.

In the Robson Valley, the current AAC is 596,000 m3 and mills in the area already depend on wood from Alberta for one third of their timber supply.[10] The SEA for that region estimates that the TSR, Forest Practices Code, PAs and proposed plan could place at risk 60 to 70 forestry jobs over the next 20 years, or 10% of total forest employment in the Robson Valley. The SEA estimates that the SLUP accounts for approximately 10 of those job losses (the SEA includes the TSR, FPC and PAs as part of the Base Case). The plan notes that even under the Base Case, the AAC is expected to decline by half in the next 50 to 60 years and "closure of one of the larger mills in the Valley is a distinct longer term possibility".

The Kootenay CORE plan was not implemented in its entirety and as a result, the SEA for that plan is of limited use when trying to assess the impact of the SLUP on that region. The Ministry of Forests has modeled the impacts of some aspects of the recent Kootenay Boundary Higher Level Plan (KBHLP):

- In the Cranbook TSA, the Ministry of Forests modeled the impacts of the biodiversity emphasis option. In the Cranbrook TSA Analysis report, the Ministry of Forests indicates that the biodiversity criteria would not affect the AAC for three decades but that following that, biodiversity would result in a slightly lower harvest (3.2% lower) for decades 3 to 10 but a higher harvest

---

[10] Holman, Gary, Socio-Economic Impact Assessment of Recommended Robson Valley Land Use Plan, 1996.

(6.2% higher) for decades 11 to 20. The AAC declined in the Cranbrook TSA as a result of TSR-1 (from 0.9 million m3 to 0.85 million m3) but it increased by 2.5% in TSR-2.

- In the 2000 Boundary TSA Report, the Ministry of Forests did some sensitivity analysis to isolate the pressures of the KBHLP on the THLB and timber supply. The results showed that the KBHLP reduced timber supply by 2.5% from 749,000 m3 per year in the Base Case to 730,000 m3 per year. This sensitivity analysis includes restrictions relating to biodiversity, mature forest retention targets, forest cover requirements for scenic areas, but not connectivity, restoration of fire maintained ecosystems and increased riparian protection within domestic watersheds. [11]

The SEAs typically do not assess the positive impacts on timber supply of Enhanced Resource Zones (ERZs).

The SEAs do not assess what the impacts of ERZs might be on the forestry sector. The SEAs note the types of intensive forestry practices that might be expected including commercial thinning, Christmas tree growing operations, woodlots and industrial forestry. However, the positive impacts are not well understood and they are not specifically addressed in the SEAs.

In the Rationale for the AAC Determination for the Strathcona TSA, the Chief Forester noted that the 2001 determination included all new PAs under the Vancouver Island Land Use Plan (VILUP) but not the full impacts of the SMZs and ERZs. However, the determination notes that recent modelling of the impacts show that "timber supply reductions in SMZs were offset by timber gains in ERZs resulting in a forecast at the TSA level that was unchanged from the Base Case projections".[12]

Other Comments on the SEAs:

A few of the SEAs comment on the fact that the AAC is not currently harvested in that region, thereby implying that a decline in the AAC would therefore not be as significant. This is particularly the case for SEAs completed in 1998/1999 including the SEA for the Mackenzie TSA. Forest licensees, however, are likely to respond very differently to a decline in short term harvest that results from depressed market conditions (as was the case in 1998) and a permanent decline in the AAC. The cut-control flexibility embodied in the AAC was designed so that licensees would consider market trends when setting the harvest level in a given year. This benefits the crown in that stumpage rates vary with market prices.

Most of the SEAs estimate the employment effects associated with potential declines in harvest volumes and the LTHL using employment coefficients expressed as Person Years (PYs) of employment per 000 m3 of wood harvested. The SEAs typically include impacts related to logging, forestry, and primary wood processing. For most SEAs, the value-added and pulp and paper employment impacts are excluded, mainly because the link to the harvest is not as direct and because B.C. continues to export chips to the U.S. Pacific Northwest. While this assumption may be reasonable at the regional level and particularly for small declines in timber harvest, on a larger provincial scale, reductions in timber supplies would ultimately affect the value-added and pulp and paper sectors.

A major shortcoming of using the SEAs to develop a provincial prospective of impacts is that they typically do not assess the impacts of PAs and SMZs in a consistent manner across different plan areas. Not only are the indicators not the same across the various plans but the assumptions underlying the Base Case are different. The following sections review quantitative indicators from a provincial perspective.

---

[11] Ministry of Forests, *Boundary Timber Supply Area Analysis Report*, November 2000.
[12] Ministry of Forests, *Rationale for AAC Determination, Strathcona TSA*, February 15, 2001.

3.1.5 Impact on Timber Harvesting Land Base

The Timber Harvesting Land Base (THLB) is defined as the "portion of the total land area of a management unit considered to contribute to and be available for long term timber supply". As noted earlier, the THLB may be affected by a number of factors including operability, accessibility, harvesting and processing technology, market values, species preferences and resource management objectives. Nevertheless, THLB can provide some insight as to the impacts of SLUPs and the PAS.

A recent Ministry of Forests document shows the crown THLB at 23 million hectares, or 24% of the entire province:

Table 3 Land Area and Timber Harvesting Land Base in B.C.

	Million hectares	% of Total Area
Total Provincial Area	95	100%
• Less non-forest (e.g. rock, glacier, urban and agricultural)	35	37%
Forestland	60	63%
• Less forest not available for timber production (e.g. parks, non-productive areas, etc.)	16	17%
Forestland available for timber production	44	46%
• Forest not suitable for timber production (e.g. riparian and old growth reserves, environmentally sensitive areas, in-operable and un-merchantable timber)	20	21%
• Private managed forestlands	0.9	1%
Crown Timber Harvesting Land Base	23	24%

Source: B.C. Ministry of Forests, *A Working Forest for B.C.*, 2001.

The THLB changes continually and the cumulative percentage of THLB that has been set aside as PAs has not been tracked. Inventory data do not accommodate looking back at what are now protected areas to determine the portions that were previously part of the THLB. As part of this project, however, information from the SLUP SEAs, TSRs and LUCO GIS data was combined with approximations supplied by MOF regional representatives to arrive at the following rough estimates of the THLB in each planning region and how much was set aside in PAs and SMZs.

Table 4 Estimates of SLUP Impacts on Timber Harvesting Land Base

REGION AND SLUP	Total Plan Area (ha)	THLB (ha)	New PAs[1] - SLUP & PAS (ha)	THLB in New PAs (ha)	% Loss of THLB to PAs	THLB in SMZs (ha)	% THLB Constrained by SMZs
CARIBOO-CHILCOTIN	8,387,108	3,590,619	709,758	183,928	4.87%	689,887	19.21%
KAMLOOPS:							
Kamloops	2,767,829	950,832	104,184	20,000	2.06%	187,660	19.74%
Okanagan-Shuswap	2,448,773	1,031,720	123,257	40,461	3.77%	n\a	
Sub Total	5,216,602	1,982,552	227,441	60,461	2.96%		
KOOTENAY-BOUNDARY	8,229,719	2,048,810	535,443	57,602	2.73%	357,792	17.46%
OMINECA-PEACE:							
Dawson Creek	2,968,693	1,086,442	156,682	40,456	3.72%	103,910	9.56%
Fort Nelson	9,848,105	2,072,811	910,078	74,256	3.58%	205,944	9.94%
Fort St. James	3,172,625	1,291,837	187,112	71,484	5.53%	131,237	10.16%
Fort St. John	4,678,279	1,179,094	204,723	16,986	1.44%	106,507	9.03%
Mackenzie	6,417,348	1,115,000	1,805,052	91,430	8.20%	172,825	15.50%
Prince George	3,417,235	1,569,000	343,950	47,070	3.00%	185,142	11.80%
Robson Valley	1,457,560	213,383	71,799	13,097	6.14%	79,983	37.48%
Vanderhoof	1,387,340	804,977	93,573	50,714	6.30%	107,062	13.30%
Sub Total	33,347,185	9,332,544	3,772,969	405,493	4.34%	1,092,610	11.71%
PRINCE RUPERT:							
Bulkley	763,835	304,199	106,153	11,119	3.53%	37,172	12.22%
Cassiar Iskut-Stikine	5,207,966	53,500	652,607	3,000	5.61%	40,000	74.77%
Kispiox	1,224,274		107,932				
Lakes	1,578,177	663,239	104,995	53,722	8.10%	325,261	49.04%
Sub Total	8,774,252	1,020,938	971,687	67,841	6.64%	402,433	39.42%
VANCOUVER ISLAND:							
VILUP	3,080,258	1,081,055		40,703	3.77%	108,690	10.05%
Clayoquot	271,140	80,407		23,361	29.05%	80,407	100.00%
VILUP & CSLUD	3,351,398	1,161,462	159,222	64,064	5.52%	189,097	16.28%
TOTALS:							
Planned Area Totals	67,306,264	19,136,925	6,376,520	839,389	4.39%	2,731,819	14.28%
Unplanned Area	27,457,583	3,863,075	1,645,896				
Provincial Totals	94,763,847	23,000,000	8,022,416				
Planned Areas w/o Mac., Cassiar and Ft. Nelson	45,832,845	15,895,614	3,008,783	670,703	4.22%	2,313,050	14.55%
LOWER MAINLAND:	4,167,515	777,245	188,069	37,830	4.87%	n\a	n\a

Note 1. Includes no-logging SMZs. Some of the "New" protected areas (approximately 385,000 ha.) were upgraded through SLUPs and the PAS from Recreation Areas or Forest Wilderness classifications and were likely already excluded from the THLB.

Source: This table was assembled from many sources including plan documents, LUCO GIS data, Ministry of Forests regional staff, and Gordon Enemark of the Ministry of Employment and Investment. In many cases the estimates of THLB in New PAs are highly speculative.

The following observations can be made from a review of Table 4:

- On average 4.4% of the THLB in planned areas has been set aside in new PAs and no-logging zones.

- The plan areas with the highest percentage of THLB captured in new PAs are Mackenzie (8.2%), Lakes (8.1%), Vanderhoof (6.3%) and Robson Valley (6.1%). Areas with lower percentages of THLB captured in new PAs are Fort St. John (1.4%) and Kamloops (2.1%). This does not recognize the size of the THLB in each region – for example, Cassiar Iskut-Stikine contains a very small portion of the province's THLB and only has 3,000 hectares of its THLB in new PAs, but this is 5.61% of the total THLB in that region.

- On average, 14.3% of the THLB in planned areas is constrained to some degree by management guidelines for non-timber values in SMZs.

3.1.6 B.C. Provincial Data on Total Productive Forest and Mature Forest Cover

As part of this project, the Land Use Coordination Office (LUCO) has provided extensive mapping of the productive forest in B.C. as well as a breakdown of two forest values overlain by land use zone categories recommended by the completed SLUPs in B.C. These are defined as follows:

- **Productive Forest**: This provides a measure of the forestland that is capable of producing a merchantable stand within a defined period of time.

- **Forestland Capability**: This provides a breakdown of the productive forest into high, moderate and low capability based on bio-geo-climatic zone classifications.

- **Mature Forest**: This provides mapping of those portions of the Productive Forest considered to be mature.

There are some caveats in using the data:

- There are limited forest inventory data available for original PAs. As a result, the indicated extent of productive forest in original PAs may be misleading.
- The data represent productive forest and forestland capability according to the most recent data as of January 2001. The data are continually updated and the same analysis at a different point in time may lead to different results.
- The data do not compare with the analyses provided by the SEAs. In general, the SEAs focused on the impacts of SLUPs on the Timber Harvesting Land Base and on the current levels of harvest.
- The data do not reflect species coverage. As noted earlier, SLUPs can alter the mix of species as well as the average age and quality of timber harvested.

Productive Forest and Forestland Capability:

The forestland capability indicator shows the proportion of high capability, moderate capability and low capability forest in the various SLUP zones.

Table 5 Summary of Forestland Capability

			Protected Areas in B.C.						
	Province	SLUP Planned Area[1]	New SLUP Protected Area	New SLUP No Logging SMZs	New Non SLUP Protected	Original	Total Protected Area (incl. no logging SMZs)	SMZs (excluding no logging SMZs)	Enhanced
Area (ha)	94,742,611	67,305,386	4,641,715	1,466,977	1,946,617	5,284,664	13.339,973	14,068,441	15,107,289
% of B.C.	100%	71.04%	4.90%	1.55%	2.05%	5.58%	14.08%	14.85%	15.95%
Productive Forest Cover (ha)	49,295,812	39,637,721	2,376,054	376,033	220,109	1,044,718	4,016,914	6,807,244	11,595,504
CAPABILITY:									
HIGH	33.0%	38.9%	27.2%	7.9%	5.4%	7.3%	14.3%	25.2%	63.4%
MODERATE	16.2%	18.7%	19.8%	16.6%	4.8%	8.7%	14.0%	20.1%	12.7%
LOW/NO	2.8%	1.3%	4.2%	1.1%	1.1%	3.8%	2.3%	5.1%	0.7%
Total	52.0%	59%	51%	26%	11%	20%	31%	50%	77%

Notes:

1. Excludes the Lower Mainland area, for which planning is not yet complete. Lower Mainland protected areas are included as non-SLUP protected areas or original protected areas.
2. The areas by type of zones sometimes vary slightly from one report table to the next depending on the data source but the differences are inconsequential.

Source: Based on LUCO data. Appendix 3 provides more detail.

The following observations can be made from the data in Table 5 and Appendix 3:

- The data show 49.3 million hectares of productive forest cover. This compares to an MOF estimate of 60 million hectares of total forestland and 44 million hectares of forestland available for timber production, as reported in the MOF publication "A Working Forest for B.C." High capability forestland comprises about 28 million hectares after netting out protected, no logging, agriculture, settlement and private lands. This compares with the current provincial THLB of about 23 million hectares.

- Some 80% of the productive forest cover (and 84% of the high capability forestland) is in SLUP planned areas.

- New SLUP protected areas and no logging zones seem to have a relatively low proportion of high capability forestland. For example, while 38.9% of the planned area has high capability forestland, new SLUP protected areas have only 27.2% and no-logging SMZs only 7.9%. New non-SLUP PAs have an even lower proportion of high capability forestland at 5.4%. In general the new SLUP PAs captured a much higher proportion of high capability forestland than either the new non-SLUP or original protected areas.

- Enhanced Resource Zones (ERZs) have a relatively high proportion of high capability forestland at 63.4%.

The following table shows essentially the same information but in a slightly different way. The table shows how much high and moderate capability forestland is in each type of zone for the SLUP areas and for all of B.C.

Table 6 Areas with High and Moderate Forestland Capability by Type of Zone

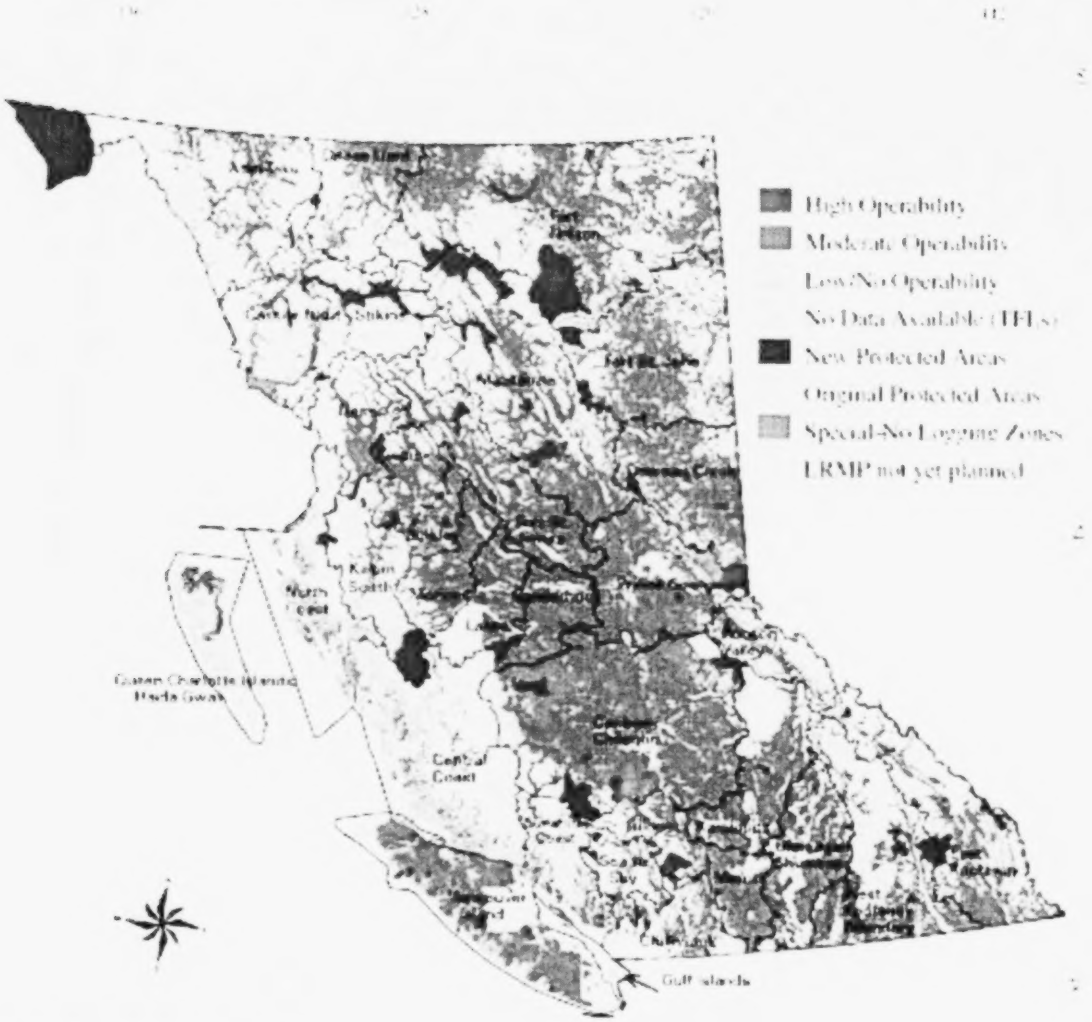
Type of Zone	Provincial Total (%)			Total SLUP Areas (%)[1]		
	Total Area	Areas with Forest Land Capability (%)		Total Area	Areas with Forest Land Capability (%)	
		High	Moderate		High	Moderate
Protected Areas (PAs):						
SLUP New PAs	4.90%	4.1%	7.0%	6.9%	4.8%	7.3%
No-Logging SMZs	1.55%	0.4%	1.6%	2.2%	0.4%	1.9%
Non-SLUP New PAs	2.05%	0.3%	0.6%	0.4%	0.2%	0.4%
Original PAs	5.58%	1.2%	3.0%	5.6%	1.0%	3.4%
Sub Total PAs	14.08%	6.1%	12.2%	15.1%	6.4%	13.1%
SMZs	14.85%	11.3%	18.4%	20.6%	12.7%	26.1%
Agriculture/Settlement/Private	3.40%	4.5%	0.8%	4.8%	5.4%	1.4%
Enhanced	15.95%	30.6%	12.5%	22.5%	36.6%	15.2%
General/Unclassified	26.29%	32.5%	36.1%	37.0%	38.9%	44.1%
Unplanned Areas	25.44%	15.0%	20.0%			
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note 1. Total SLUP Areas exclude the Lower Mainland region.
Source: Based on LUCO data. Appendix 3 provides more detail.

The following table and accompanying map show the amount of high capability forestland in protected areas, SMZs and ERZs for each planning area. The data show that the percentage of high capability forestland in new PAs is highest in the Cassiar-Stikine region at 31% (although the SEAs show that very little merchantable timber is currently harvested there), the Mackenzie region at 17% (again, the SEA shows limited effect in the short term as the AAC can be maintained for over 35 years), Lakes (10%), Kispiox (9.5%) and Robson Valley (8.1%).

Overall, new PAs and no-logging zones account for 5.4% of the high capability forestland in planned areas (4.1% if one excludes Mackenzie, Cassiar-Stikine and Fort Nelson). This compares with the earlier estimate of 4.4% of THLB captured by new PAs and no-logging zones.

About 37% of the high capability forestland in planned areas is in ERZs with Cariboo, Vanderhoof, Fort St. James and Mackenzie all showing proportions over 50%.

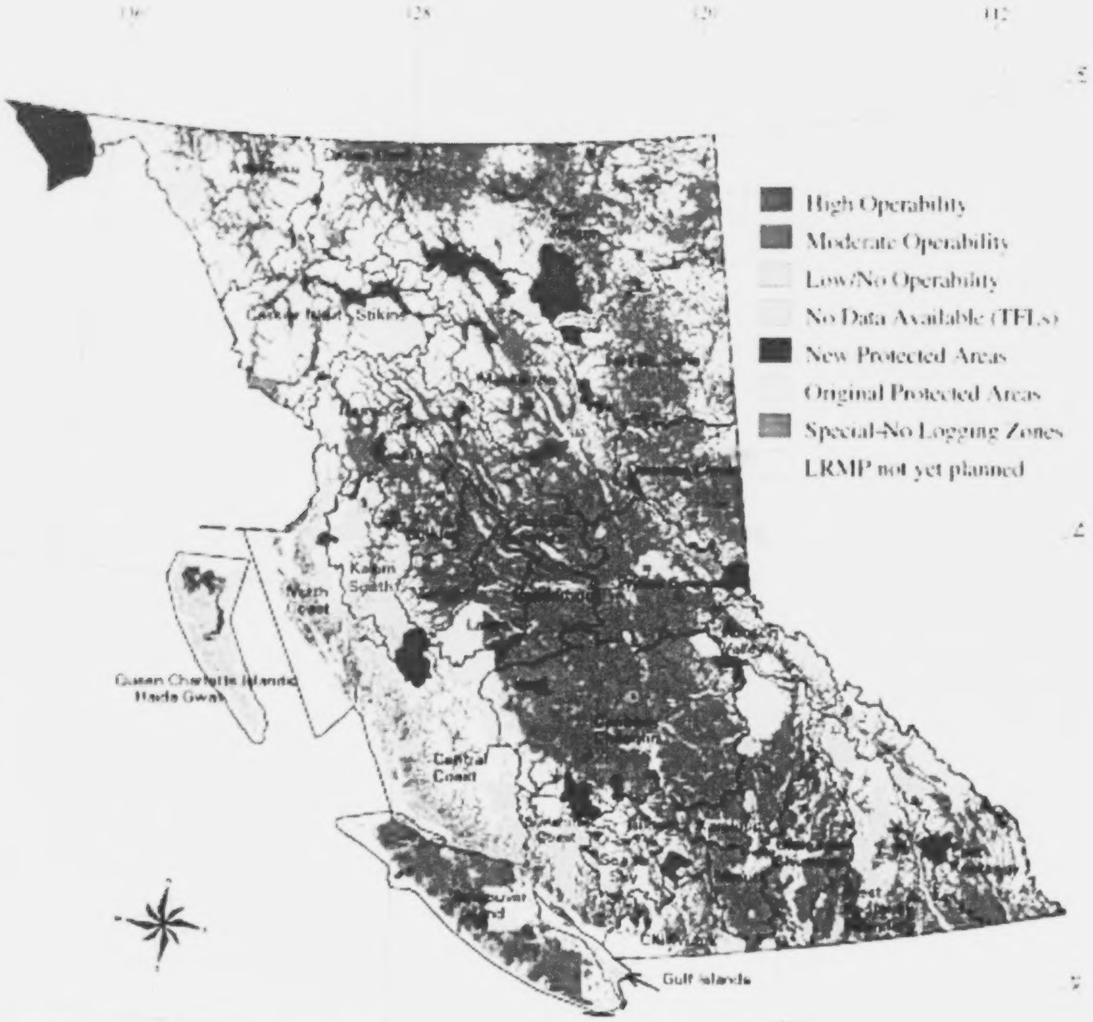

High Operability
Moderate Operability
Low/No Operability
No Data Available (TFLs)
New Protected Areas
Original Protected Areas
Special-No Logging Zones
LRMP not yet planned
Atlin
Dease Liard
Fort Nelson
Cassiar Iskut-Stikine
Fort St. John
Mackenzie
Dawson Creek
Kalum South
North Coast
Queen Charlotte Islands/
Haida Gwaii
Robson Valley
Cariboo Chilcotin
Central Coast
Sea to Sky
Vancouver Island
Chilliwack
Gulf islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic, Datum: NAD83

Forest Land Capability
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants


136
128
120
112
■ High Operability
■ Moderate Operability
□ Low/No Operability
□ No Data Available (TFLs)
■ New Protected Areas
Original Protected Areas
▨ Special-No Logging Zones
LRMP not yet planned
Cassiar Iskut-Stikine
Kalum South
North Coast
Queen Charlotte Islands Haida Gwaii
Central Coast
Vancouver Island
Gulf Islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic; Datum: NAD83

Forest Land Capability
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants

Table 7 Forestland Capability by Planning Zone and Planning Area

REGION AND SLUP	Total Plan Area (ha)	Total Productive Forest (ha) from LUCO	LUCO High Capability Forest	New PAs[1] - SLUP & PAS (ha)	LUCO High Cap. Forest in New PAs		LUCO High Cap. Forest in SMZs		LUCO High Cap. Forest in ERZs	
					Area (ha)	%	Area (ha)	%	Area (ha)	%
CARIBOO-CHILCOTIN	8,387,108	6,512,392	4,734,885	709,758	151,056	3.2%	700,500	14.8%	2,832,727	59.8%
KAMLOOPS:										
Kamloops	2,767,829	1,696,775	985,371	104,184	42,302	4.3%	113,725	11.5%	0	0.0%
Okanagan-Shuswap	2,448,773	1,679,629	929,504	123,257	31,624	3.4%				
Sub Total	5,216,602	3,376,404	1,914,875	227,441	73,926	3.9%	113,725	5.9%	0	0.0%
KOOTENAY-BOUNDARY	8,229,719	3,855,298	1,710,907	535,443	72,370	4.2%	278,332	16.3%	374	0.0%
OMINECA - PEACE:										
Dawson Creek	2,968,693	2,259,989	1,495,562	156,682	52,095	3.5%	174,398	11.7%	496,905	33.2%
Fort Nelson	9,848,105	5,145,847	4,258,302	910,078	163,425	3.8%	691,435	16.2%	1,887,864	44.3%
Fort St. James	3,172,625	2,229,120	1,419,369	187,112	85,487	6.0%	131,356	9.3%	826,607	58.2%
Fort St. John	4,678,279	2,593,181	2,296,702	204,723	15,855	0.7%	263,848	11.5%	750,998	32.7%
Mackenzie	6,417,348	3,400,024	1,370,929	1,805,052	232,731	17.0%	211,667	15.4%	706,128	51.5%
Prince George	3,417,235	2,505,106	1,975,520	343,950	69,666	3.5%	14,885	0.8%	965,062	48.9%
Robson Valley	1,457,560	651,112	222,230	71,799	17,954	8.1%	81,376	36.6%	48,908	22.0%
Vanderhoof	1,387,340	1,213,975	1,058,471	93,573	75,007	7.1%	44,927	4.2%	628,762	59.4%
Sub Total	33,347,185	19,998,354	14,097,085	3,772,969	712,220	5.1%	1,613,892	11.4%	6,311,234	44.8%
PRINCE RUPERT:										
Bulkley	763,835	566,541	328,883	106,153	10,503	3.2%	32,476	9.9%	0	0.0%
Cassiar Iskut-Stikine	5,207,966	1,240,848	666,646	652,607	208,539	31.3%	268,293	40.2%	0	0.0%
Kispiox	1,224,274	828,732	525,116	107,932	49,948	9.5%	29,825	5.7%	0	0.0%
Lakes	1,578,177	964,824	883,415	104,995	88,719	10.0%	168,559	19.1%	0	0.0%
Sub Total	8,774,252	3,600,945	2,404,060	971,687	357,709	14.9%	499,153	20.8%	0	0.0%
VANC. ISLAND:	3,351,398	2,294,328	1,295,782	159,222	54,401	4.2%	105,067	8.1%	434,419	33.5%
TOTALS:										
Planned Areas[2]	67,306,264	39,637,721	26,157,594	6,376,520	1,421,682	5.4%	3,310,669	12.7%	9,578,754	36.6%
Unplanned Area	27,457,583	9,658,091	5,124,534	1,645,896	97,474	1.9%	228,416	4.5%	0	0.0%
Provincial Totals	94,763,847	49,295,812	31,282,128	8,022,416	1,519,156	4.9%	3,539,085	11.3%	9,578,754	30.6%
Planned without Mackenzie, Fort Nelson & Cassiar										
	45,832,845	29,851,002	19,861,717	3,008,783	816,987	4.1%	2,139,274	10.8%	6,984,762	35.2%
LOWER MAINLAND	4,167,515	184,502	154,737	188,069	7,255	4.7%	124,032	80.2%	0	0.0%

Notes to Table 7

1. Includes no-logging SMZs. Some of the "New" PAs (approximately 385,000 ha.) were upgraded through SLUPs and the PAS from Recreation Areas or Forest Wilderness classifications and were likely already excluded from the THLB.
2. Excludes the Lower Mainland (planning not yet complete).
3. Forestland Capability is derived from bio-geo-climatic zone classifications (see Appendix 3).

Source: LUCO data. Appendix 3 provides more detail.

Mature Forest by Forestland Capability

As noted earlier, the SEAs gave particular consideration to the volumes of mature timber being captured by the PAs, in assessing the more immediate economic impacts. While data on mature timber volumes being captured by PAs are not available at the provincial level, there are data on the land area covered by mature forest. For this study, LUCO intersected the mature forest cover data with the forestland capability data to derive spatial data on mature forest cover by forestland capability. These data are shown in the tables following.

Table 8 Summary of Mature Forest by Forestland Capability

	Province	SLUP Planned Area[1]	Protected Areas in B.C.					SMZs (excluding no logging SMZs)	Enhanced
			New SLUP Protected Area	New SLUP No Logging SMZs	New Non-SLUP Protected Areas	Original Protected	Total Protected Area (incl. no logging SMZs)		
Area (ha)	94,742,611	67,305,386	4,641,715	1,466,977	1,946,617	5,284,664	13,339,973	14,068,441	15,107,289
% of B.C.[1]	100.0%	71.04%	4.90%	1.55%	2.05%	5.58%	14.08%	14.85%	15.95%
Mature Forest Cover:									
Hectares:	27,547,016	21,495,592	1,603,839	279,022	49,060	572,498	2,504,419	4,301,731	5,630,984
Mature Forest Cover by Forest Land Capability:									
HIGH	15.8%	18.5%	17.2%	5.6%	1.4%	3.2%	8.1%	13.0%	28.2%
MODERATE	12.1%	12.5%	16.3%	12.6%	1.1%	6.8%	9.9%	16.5%	8.5%
LOW/NO	1.7%	0.8%	1.1%	0.8%	0.0%	0.8%	0.8%	1.1%	0.5%
Total	29.6%	31.9%	34.6%	19.0%	2.5%	10.8%	18.8%	30.6%	37.3%

Table 9 Summary of High and Moderate Mature Forest with Forestland Capability

Type of Zone	Provincial Total (%)			Total SLUP Areas (%)[1]		
	Total Area	Mature Forest with Forest Land Capability (%)		Total Area	Mature Forest with Forest Land Capability (%)	
		High	Moderate		High	Moderate
Protected Areas (PAs):						
SLUP New PAs	4.90%	5.2%	6.7%	6.9%	6.4%	8.9%
No-Logging SMZs	1.55%	0.6%	1.6%	2.2%	0.7%	2.2%
Non-SLUP New PAs	2.05%	0.7%	0.8%	0.4%	0.2%	0.3%
Original PAs	5.58%	1.7%	3.6%	5.6%	1.4%	4.3%
Sub Total PAs	14.08%	8.2%	12.7%	15.1%	8.6%	15.6%
SMZs	14.85%	12.5%	20.5%	20.6%	14.7%	27.4%
Agriculture/Settlement/Private	3.40%	3.0%	0.2%	4.8%	3.7%	0.7%
Enhanced	15.95%	28.5%	11.2%	22.5%	34.2%	15.2%
General/Unclassified	26.29%	31.8%	31.0%	37.0%	38.8%	41.1%
Unplanned Areas	25.44%	16.0%	24.3%			
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: LUCO data. Appendix 3 provides more detail.

Table 10 Mature Forest Cover by Planning Zone and by Planning Area

REGION AND SLUP	Total Plan Area (ha)	Total Mature Forest (ha)	High Capability Land with Mature Forest	New PAs[1] - SLUP & PAS (ha)	LUCO High Cap. Land w. Mature Forest in New PAs		LUCO High Cap. Land w. Mature Forest in SMZs		LUCO High Cap. Land w. Mature Forest in ERZs	
					Area (ha)	%	Area (ha)	%	Area (ha)	%

CARIBOO-CHIL.	8,387,108	3,737,044	2,531,465	709,758	91,740	3.6%	398,542	15.7%	1,431,107	56.5%
KAMLOOPS:										
Kamloops	2,767,829	923,525	476,289	104,184	25,235	5.3%	59,012	12.4%	0	0.0%
Okanagan-Shuswap	2,448,773	847,783	400,356	123,257	14,922	3.7%	n/a	n/a	n/a	n/a
Sub Total	5,216,602	1,771,308	876,645	227,441	40,157	4.6%	n/a	n/a	n/a	n/a
KOOTENAY-B.	8,229,719	1,395,997	453,584	535,443	25,487	5.6%	77,925	17.2%	103	0.4%
OMINECA PEACE:										
Dawson Creek	2,968,693	1,233,682	705,297	156,682	28,866	4.1%	79,459	11.3%	223,866	31.7%
Fort Nelson	9,848,105	2,046,983	1,560,077	910,078	72,136	4.6%	316,393	20.3%	404,551	25.9%
Fort St. James	3,172,625	1,622,281	963,777	187,112	66,747	6.9%	88,992	9.2%	523,769	54.3%
Fort St. John	4,678,279	981,749	759,921	204,723	6,020	0.8%	101,184	13.3%	312,148	41.1%
Mackenzie	6,417,348	2,251,365	768,405	1,805,052	133,384	17.4%	138,453	18.0%	360,660	46.9%
Prince George	3,417,235	1,484,582	1,048,221	343,950	49,154	4.7%	84,598	8.1%	435,980	41.6%
Robson Valley	1,457,560	470,740	139,930	71,799	12,679	9.1%	50,356	36.0%	30,658	21.9%
Vanderhoof	1,387,340	714,910	599,232	93,573	48,390	8.1%	35,214	5.9%	375,026	62.6%
Sub Total	33,347,185	10,806,292	6,544,860	3,772,969	417,376	6.4%	894,649	13.7%	2,666,658	40.7%
PRINCE RUPERT:										
Bulkley	763,835	399,803	200,438	106,153	8,392	4.2%	24,352	12.1%	0	0.0%
Cassiar Iskut-Stikine	5,207,966	944,944	456,280	652,607	170,363	37.3%	182,874	40.1%	0	0.0%
Kispiox	1,224,274	662,634	380,356	107,932	38,545	10.1%	23,375	6.1%	0	0.0%
Lakes	1,578,177	591,654	528,844	104,995	66,447	12.6%	107,890	20.4%	0	0.0%
Sub Total	8,774,252	2,599,035	1,565,918	971,687	283,747	18.1%	338,491	21.6%	0	0.0%
VANC. ISLAND	3,351,398	1,185,916	528,844	159,222	47,682	9.0%	66,668	12.6%	169,772	32.1%
TOTALS:										
Planned Area[2]	67,306,264	21,495,592	12,501,316	6,376,520	906,189	7.2%	1,835,287	14.7%	4,267,640	34.1%
Unplanned Area	27,457,583	6,575,784	2,476,825	1,645,896	215,402	8.7%	39,424	1.6%	0	0.0%
Provincial Totals	94,763,847	28,071,376	14,978,141	8,022,416	1,121,591	7.5%	1,874,711	12.5%	4,267,640	28.5%
Planned w/o Mack., F.Nelson & Cassiar	45,832,845	16,252,300	9,716,554	3,008,783	530,306	5.5%	1,197,567	12.3%	3,502,429	36.0%
LOWER MAINLAND	4,167,515	508,961	321,887	188,069	27,085	8.4%	62,079	19.3%	n/a	n/a

Notes to Table 10:

1. Includes no-logging SMZs. Some of the "New" protected areas (approximately 385,000 ha.) were upgraded through SLUPs and the PAS from Recreation Areas or Forest Wilderness classifications and were likely already excluded from the THLB.
2. Excludes the Lower Mainland (planning not yet complete).
3. Forestland Capability is derived from biogeoclimatic zone classifications (see Appendix 3).

Source: Based on LUCO data. Appendix 3 provides more detail.

The data in Tables 8-10 show that slightly higher proportions of the mature forestland are captured by new PAs, than forestland in general. This is to be expected since new PAs are more likely to be targeting undisturbed forests than previously logged areas. The largest difference in these proportions is on Vancouver Island, where the percentage of high capability mature forestland captured by new PAs is 9.0%, compared to 4.2% for high capability land in general.

3.1.7 Impact Assessment of SLUPs on Key Indicators

This section summarizes the economic impacts of SLUPs on the forest industry. The analysis is based on a review of quantitative data and approximately 20 interviews with industry representatives. This includes 14 licensees, 5 industry associations and one consulting firm. Of these, fifteen interviewees have been involved in the development of SLUPs with 10 having been involved in more than one SLUP. Approximately 20 interviewees continue to be involved in the implementation of a SLUP in their region. Three of the licensee representatives had previously worked as District Managers at the Ministry of Forests.

At least ten other interviews were conducted with MOF and other government representatives in the forest sector. The results of these interviews are summarized later in the report.

The following table summarizes the results of our analysis. More details are provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Forest Industry***
What would have happened without SLUPs	Most interviewees believe that the forest sector would have developed differently without SLUPs: • Vancouver Island would have required some form of land use planning, but the planning areas may have been smaller. • The forest industry in the Interior (outside the Kootenays) would have probably attracted more attention from environmental groups. • In the Kootenays, many interviewees believe that SLUPs contributed to the polarization of attitudes and led to more conflicts.
Changes in the timber harvesting land base (THLB) and potential long term harvest level and the AAC due to new PAs	Based on the interviews, the perceived changes due to PAs and SMZs are as follows: • 75% of the interviewees believe that the recent PAs will probably or definitely lead to a decrease in the LTHL and the AAC. Approximately 20% believe that PAs will not impact the LTHL or the AAC. One interviewee in the Cariboo believes that PAs could actually increase the LTHL and the AAC by clarifying areas that are available for harvest. • On Vancouver Island, interviewees expect a further reduction in LTHL and AAC – potentially up to 5% • In the Kootenays, licensees believe that SLUPs have already led to a decline of 10% to 15% in the LTHL and the AAC. • In the Interior of B.C. (except in the Kootenays), SLUPs are not expected to have much of an impact for at least 10 years (Prince George), although in some areas, the impacts are not likely to be felt for many decades (e.g. Kamloops).
Change in the potential LTHL and the AAC due to SMZs and EMZs	Based on the interviews: • At least 65% of interviewees believe that Special Management Zones (SMZs) will have negative impacts on the LTHL and the AAC; approximately 25% believe that SMZs and Enhanced Management Zones (EMZs) will have no impact; and two respondents (10%) believe that the net impacts will be positive. One issue is that in most areas, the Enhanced Resource Management Zones have not led to differences in forest management on the ground.
Impacts of any new constraints on harvesting activities	Based on the interviews: • 94% (16 out of 17 interviewees) believe that SLUPs imposed additional constraints over and above the FPC (e.g. visual quality objectives, ungulate winter range, Caribou habitat, riparian areas, etc.). However, at least half of the respondents qualified their responses by indicating that many of the constraints fall within the broad range of the FPC. Only in the Kootenays were the licensees denouncing the incremental constraints as too costly and so widespread that licensees will not succeed at obtaining permits to harvest the AAC.

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on the* ***Forest Industry***
Impacts on operating costs (road building, planning, layout, etc.)	Based on interviews: • All of the respondents except one believe that SLUPs have led to some increases in operating costs for the forest industry. • Half believe that SLUPs led to cost increases lower than 5% of harvesting costs, mainly because of increases in planning costs (estimates vary between $0.10 per m3 in the Northern Interior and $0.50 per m3 in most areas of Vancouver Island – although in Clayoquot Sound, the additional planning and inventory costs are almost $20 per m3). Some of the interviewees in the Interior believe that planning costs have increased but better planning resulting from SLUPs should help reduce harvesting costs. • Half believe the increases are higher than 5%. Most respondents who believe that SLUPs have increased harvesting costs significantly believe that SLUPs have led or will lead, to reduced volumes and incremental constraints. Most of these interviewees are in the Kootenays and the B.C. Coastal regions.
Impacts on level of land use certainty	Based on interviews: • Twelve out of twenty respondents believe that SLUPs have led to greater land use certainty. Most respondents who do not believe that SLUPs increased land use certainty operate in Coastal B.C. and in the Kootenays. • Some of the reasons SLUPs did not lead to greater land use certainty are that SLUPs have not addressed First Nations concerns, SLUPs have not had the support of international environmental groups, and that there remains operating uncertainties in the SMZs.
Impact on investment	• Half of the interviewees indicated that SLUPs have had no impact on investment for the following reasons: land use certainty is only one factor affecting investment, SLUPs have not increased certainty, and SLUPs are too recent to have had much impact. Some of the interviewees mentioned that although SLUPs did not increase investment, they resulted in companies proceeding with investment plans, especially in the Interior of B.C. in regions where SLUPs are not expected to have much impact on the AAC or the LTHL. • One third of the respondents believe that SLUPs have decreased investment mainly because they believe that SLUPs have led to declines in the AAC and the LTHL. Most of these are on Vancouver Island and the Kootenays, where TSR-1 led to major declines in the AAC. • Three of the interviewees (16%) believe that SLUPs will lead to increased investment. These are all based in the Cariboo and the Northern Interior.
Impacts on approvals of FDPs	One third of interviewees in the forest sector who commented on the impacts of SLUPs on approvals of Forest Development Plans (FDPs) believe that SLUPs have quickened the process whereas one third believe that SLUPs have led to delays. The balance believes that SLUPs had no impact on approvals of FDPs or that the impacts varied depending on the area within an LRMP region. Comments from the interviewees are as follows: • All of the interviewees based in the Kootenays believe that SLUPs have delayed the process for FDPs. • In other regions, most interviewees believe that in general zones, SLUPs are either having no impact or they have quickened the approval process of FDPs. • In some of the regions, the interviewees mentioned that the plans were very recent and as a result, SLUPs had had no impact on the FDP approval time. However, the

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the*** **Forest Industry**
	expectation was that the implementation of the plans would lead to quicker approvals of FDPs. • Some interviewees mentioned that SLUPs seem to first lead to delays in the approval of FDPs but as the land use plans get implemented, the rules are clarified and the process is streamlined. • The interviewees in the Cariboo and on Vancouver Island mentioned that the FDPs are taking longer to get approved in zones that require joint approval from MOF and MELP (Joint approval is required for FDPs in SMZs in the Cariboo region and Low Intensity Zones in Vancouver Island).
Impacts on forest certification initiatives	• Approximately half of the interviewees believe that SLUPs have helped the certification process and two thirds believe that SLUPs will help. Some of the areas where SLUPs contribute to certification include: - Preparing management plans; - Building capacity and interest in stakeholder groups; and - Providing better data. • Most interviewees agree that SLUPs do not help in obtaining the ISO 14001 certification. • Most interviewees did not have first hand knowledge with the CSA and FSC certification. Some of the issues mentioned include: SLUPs do not satisfy the public consultation process, SLUPs are not detailed enough to meet certification requirements, and certification is area based rather than volume based. • One interviewee mentioned that the lack of SLUPs in certain regions has made the certification process more complex.
Impacts on conflicts with other stakeholders over timber harvesting activities	• Some 60% of interviewees indicated that SLUPs have succeeded at reducing conflicts between the forest industry and environmental groups. Most who believe that SLUPs have not reduced conflicts are in the Kootenays and Coastal B.C.. particularly in the Lower Mainland where only a Protected Area Strategy has been completed and in the Central Coast where an agreement was not yet reached when the interviews were completed. The interviewees in those regions believe that some of the environmental groups did not buy into the process and as a result, they have not accepted the land use plans. • Many interviewees noted that prior to SLUPs, there were not many conflicts between the forest industry and the tourism and recreation sector so that the impacts of SLUPs has been neutral. Others felt that SLUPs had greatly reduced conflicts between those sectors. • All of the interviewees except two believed that SLUPs did nothing to reduce conflicts with First Nations since they were generally not involved in the process.
Impacts on communication with govt. agencies, stakeholders, and First Nations	• Most respondents believe that SLUPs have led to more communication between the forest industry and government agencies and other stakeholder groups. • Most interviewees believe that SLUPs did not have an impact on communication with First Nations mainly because they chose not to participate in SLUPs. • For some interviewees, increased communication was the single greatest benefit of SLUPs. • Three quarters of interviewees believe that SLUPs have led to increased communication among the various agencies, and in particular MOF and MELP. Approximately one quarter of the respondents specifically referred to the Inter-Agency Committees that offer an opportunity for high-level bureaucrats to meet over land use

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on the* ***Forest Industry***
	issues. - The only respondents who believe that SLUPs have led to a worsening of communication between agencies are in the Kootenays. - 60% of respondents believe that the increased communication between agencies has led to more cooperation and efficiency in land use management.
Impacts on resource inventories developed by governments and others	Based on interviews: - Some 65% of respondents believe that SLUPs have resulted in better resource inventories. Some of the interviewees who noted that SLUPs did not lead to better inventories indicated that SLUPs identified the need for specific inventories but the work has yet to be completed. Many interviewees noted that SLUPs helped identify gaps in inventory data. - SLUPs have increased inventory research by governments and industry. - SLUPs have led to better inventories, particularly in the environmental sector, e.g. Caribou and other wildlife inventories. - Other issues include costs of inventory research and the fact that inventories are often developed after decisions are made. - Almost all interviewees agreed that SLUPs have led to better sharing of resource use information.
For those areas that have not yet had an SLUP, perceived benefits and costs of having one	- Very few interviewees could comment on the costs and benefits of not having a SLUP in a given region. Some comments were made regarding Merritt, the Sea-to-Sky region and some of the Northern areas. - In general, there are no benefits associated with not having a SLUP. In Merritt, some of the needs for an SLUP are met through the IFPA process.

3.1.8 Summary and Conclusions

This section summarizes the forest sector analysis and provides some conclusions on the impacts of PAs, no-logging/ wildland zones, SMZs and ERZs. This section also makes a few observations on regional differences in impacts and perceptions that were noted in the course of the analysis.

Impacts of PAs

In general, SLUPs and the PAS appear to have avoided capturing high capability forestland in PAs. New PAs (SLUP and Non-SLUP) cover 7.0% of the total provincial land base but only 4.9% of areas with high capability forestlands.

In as much as new protected areas were carved out of the measured timber harvesting land base (THLB), the designation of new PAs directly reduced the THLB. The reduction in THLB will ultimately translate into lost jobs/ foregone opportunities for B.C. It is not possible to determine accurately the employment and other economic impacts of the loss in THLB for several reasons:

- There are no consistent, province wide estimates of the SLUP and PAS impacts on timber volumes. Rough estimates by regional MOF staff and others, using differing terminology and methodology from region to region, indicate the impacts on the THLB. Provincial coverage data compiled by LUCO indicates the extent of capture of high capability forestlands with mature forest cover by new PAs. Polygon by polygon analyses conducted during the formulation of each plan used a broad variety of methodologies, data sets and indicators to assess forest industry impacts, but these cannot be effectively stitched into a province wide analysis.

- There is little insight on how the impacts on THLB or on areas of high capability forestland are distributed across the various species, age classes and qualities of timber.
- There is no direct, proportional link between the THLB and the current AAC. As noted in the SEAs, there are opportunities to delay the negative effects of reductions in the THLB. Many SEAs demonstrate the economic impacts of the LRMPs assuming that the AAC will be maintained in the near term, even though this means accelerating the 'fall down' effect. In general, the SEAs implicitly suggest that maintaining the AAC at current levels, and minimizing near term economic disruption, justifies the prospect of ultimately accelerating the 'fall down' to LTHL (i.e. that the net negative impacts will be smaller if postponed).
- The THLB reduction may not yield an immediate impact on the AAC, but the impacts may be immediate on forest industry investment if investors perceive growth prospects to have been reduced.

Table 11 on the following page summarizes some rough estimates of the economic cost of setting aside high capability forestlands in new PAs. Once the SLUP and the PAS impacts are fully experienced, they may ultimately reduce forest industry employment potential by 2,000 PYs in primary forest sector employment and another 1,200 PYs in value added and other operations. The table also shows that ultimately, there may be a loss of some $56.2 million per annum in stumpage revenues, rents and royalties (excluding other direct industry payments of $37.4 million and excluding income tax and other payments from employees). The reduced potential represents a very rough estimate of the economic costs of setting aside an additional 4.4% of high capability forestlands in new PAs.

It should not be assumed that these impacts have already occurred or are presently occurring, since as discussed previously, most of the AAC impacts from SLUPs can be deferred for one or more decades. However, driving the economic impact estimates is the assumption that the withdrawal of high capability forestlands causes an eventual, proportional, and equally distributed change in the annual volume of crown timber harvested and processed.

The above noted job and government revenue impacts may be offset to some extent by positive impacts associated with reduced conflict and other benefits.

Table 11 Magnitude of Eventual Forest Sector Economic Impacts from New PAs

	Total B.C.	New SLUP PAs	New Non-SLUP PAs	Total
% High Capability Lands		4.1%	0.3%	4.4%
LTHL (million m3) (% Drop)	60.7 million m3	-2.49 (-4.1%)	-0.18 (-0.3%)	-2.67 (-4.4%)
Employment:				
• Primary logging & processing	0.753PYs/ 000 m3	1,875 PYs	136 PYs	2,011 PYs
• All employees (primary, secondary, government)	1.2 PYs/000 m3	2,988 PYs	216 PYs	3,204 PYs
Government Revenues		$ Million		
• Stumpage revenues, rents and royalties	$21.03 per m3	$ 52.4 million	$3.8 million	$56.2 million
• Other direct industry payments	$14.01 per m3	$34.9 million	$2.5 million	$37.4 million

Notes to Table 11:
1. These are only illustrative of the range of impacts that PAs may have. The actual impacts will depend on the timing of reductions in timber volumes and various other factors.
2. The employment coefficient is based on the PriceWaterhouseCooopers 1999 data.
3. The Long Term Harvest Level is from the Ministry of Forests.

Source: Prepared by *Pierce Lefebvre Consulting.*

Impacts of No-Logging/ Wildland Zones

SLUPs have also led to almost 1.5 million hectares, equivalent to 1.5% of the B.C. land base, being designated as No-Logging/Wildland zones. The economic impacts of the no- logging zones, however, are not likely to be immediate:

- Some 1.1 million hectares are in the Mackenzie region, and the SEA for that region suggests that the impacts on the AAC may be delayed for at least 35 years.
- Another 0.2 million hectares are in the Cassiar-Stikine region where very little commercial logging has taken place.
- The balance or 150,000 hectares (0.16% of the B.C. land base) are in the Bulkley and Prince George regions and the loss of those areas for harvesting may result in more current impacts.

Impacts of SMZs and ERZs

Approximately 25% of the high capability forestlands are in SMZs. It is very difficult to assess the economic impacts of those zones on the industry.

Approximately 65% of interviewees believe that the SMZs will have negative impacts on the long term harvest level while the other 35% believe that SMZs will have no impact, particularly if the benefits from ERZs are taken into account. Some of the licensees expressed some concern that the benefits related to ERZs have not materialized, however, it is possible that in some areas, these may offset most or all of the negative effects of SMZs on the forest industry. While the benefits of ERZs may not yet be apparent, it is significant that the Chief Forester noted the potential benefits of ERZs in his rationale for the AAC determination for the Strathcona TSA on Vancouver Island.

Also, at least half of the interviewees believe that many of the constraints suggested in the SLUPs fall within the broad range of the Forest Practices Code. Only in the Kootenays were the licensees overwhelmingly concerned about the SLUP constraints.

Regional Differences

The PAS and SLUPs have impacted timber values in some regions more than others. In most SLUP regions, forest industry representatives had a generally positive view on the overall effects of SLUPs and the PAS. While they felt that SLUPs and the PAS reduced the THLB and increased harvesting constraints, they also believed that SLUPs led to more land use certainty, fewer conflicts with other stakeholders, more communication and other benefits that offset at least some of the costs from SLUPs and the PAS.

For most regions in B.C., the quantitative analysis supported the interview results. For example, forest industry representatives believe that while SLUPs and the PAS are likely to lead to a drop in LTHL, the impacts are not likely to be felt for at least 10 years, and in some regions much further into the future.

There were two B.C. regions where forest industry representatives seemed much more critical of SLUPs and the PAS, the Kootenay region and Vancouver Island/ B.C. South Coast. Forest industry representatives were also critical of the Central Coast process, but the interviews were completed before an agreement was reached in Spring 2001. The following comments summarize the findings on those two regions.

Kootenay Region

Forest industry representatives were most critical of SLUPs and the PAS in the Kootenay-Boundary (K-B) region. They believe that SLUPs and the PAS will have a significant negative effect on the THLB and timber volumes with little or no benefit in terms of increased land use certainty or reduced conflicts with stakeholders.

The quantitative analysis shows that the K-B region is about average for planned areas in terms of percentage of the land base in new PAs and the amount of THLB or high capability forestland that has been withdrawn for PAs. The SMZs for that region however, appear to cover a larger than average proportion of important timber values:

- PAs account for 14% of the K-B region, 7% in original PAs and 7% in new PAs, which approximates the average for B.C.

- New PAs in the K-B region capture about 2.7% of the harvestable land base in that region, which is significantly lower than the average for planned areas of 4.4%. The percentages of high capacity forestland and mature forests on high capacity land in the new PAs is very similar to the averages for planned areas, particularly if Mackenzie, Cassiar and Fort Nelson are excluded from the planned area average.

- SMZs in the K-B region account for about 16% of the total planning area, which is lower than the average for all planned areas (23%). The percentages of THLB (17%), high capability forestland (16%) and high capability land with mature forests (17%) in SMZs, however, are significantly higher than the averages for total planned areas of 15%, 12%, and 11% respectively (excluding Mackenzie, Cassiar and Fort Nelson). Moreover, the KBLUP designated only 1% of its plan area as ERZs and these are mainly directed at coal tenures (78% of the coal tenures in the K-B region are in ERZs). Subsequent to the Kootenay-Boundary Land Use Plan, however, the 2000 Higher Level Plan provides measures for intensive forest management in Enhanced Resource Development Zones (ERDZs) mapped for all six Nelson region forest districts (excluding Revelstoke/ Columbia, which is not part of the Higher Level Plan).

The K-B (Nelson) region was especially affected by TSR-1 as the coniferous AAC dropped by 9.3%, the largest drop of any region in the province. Some of the negative perception of SLUPs in the K-B region may stem from the combined impacts of the SLUPs, the Forest Practices Code and the 'falldown' effects.

Vancouver Island, South and Central Coast

Vancouver Island, South and Central Coast were the other regions where forest industry representatives were more negative in their views of SLUPs.

Forest industry representatives on Vancouver Island and in the South and Central Coast regions were, in general more critical of SLUPs and the PAS than their counterparts in the B.C. Interior. They believe that SLUPs and the PAS will lead to some significant declines in the THLB and the AAC, that the benefits of ERZs have yet to materialize and that environmental groups did not buy into the process and as a result, have not accepted the land use plans in those regions.

The quantitative analysis shows that the VILUP seems to have protected a relatively greater portion of high capability forested areas than other planned areas of B.C.

- The Vancouver Island data show that new PAs (4.7% of the land base) capturing 5.5% of the THLB, which is higher than the 4.4% average for all planned areas. Also, new PAs on Vancouver Island capture 9% of the high capability mature forestland, compared to 7.2% for all planned areas.

On the other hand:

- SMZs account for only 8% of the total area of Vancouver Island, compared to the 21% average for all planned areas. The proportion of mature forest on high capability land in SMZs (12.6%) is much closer to the average for all planned areas of 14.7%.

- ERZs on Vancouver Island account for 24% of the total area and include 32% of the mature forest on high capability land, which is comparable to other SLUP areas that have chosen to designate ERZs as part of the plan.

The Lower Mainland has a Protected Area Strategy but not a comprehensive SLUP, and the Central Coast did not have an agreed upon SLUP when the interviews were completed. Many of the industry interviewees operate in all three regions of Coastal B.C. and their comments partly reflected the frustrations experienced in reaching an agreement in the Central Coast and with on-going conflicts in the Elaho Valley and other regions of the South Coast of B.C. In general, the interviewees acknowledged that conflicts have been reduced on Vancouver Island but note that this has been achieved at a significant cost to the industry and the province (as noted earlier, the settlement with MacMillan Bloedel for example added to $83.5 million for loss of tenures in the Clayoquot/ Strathcona and Tahsis regions).

3.2 Mining Industry

3.2.1 Overview of the B.C. Mining Industry

The mining industry in B.C. continues to be a significant source of highly paid jobs for communities throughout the province, in spite of a substantial decline in activity over the past 20 years. The Ministry of Energy and Mines (MEM) reports statistics on the B.C. mineral economy, some of which are summarized in the table following:

Table 12 Key Statistics on the B.C. Mining Sector – 1999

	Direct Employment	Sales (C$ millions)	Number of Operations
• Metal mining	3,055	$1,223	12
• Coal mining	3,203	915	8
Sub-total (metal and coal mining)	6,258	$2,138	20
• Industrial minerals	461	50	39
• Exploration	951	Not applicable	128
Sub-total (mining and exploration)	7,670	2,188	
• Cominco smelting & refining plant	1,872		1
Total	9,542		

Notes:

1. The employment data exclude 2,879 employees from 911 operations in the construction aggregate sector (sand, gravel pits and quarries), approximately 1,800 jobs at Alcan's Aluminium plant, and another 4,600 employees in the downstream mineral processing sector (i.e. iron and steel plants, aluminium foil, asphalt, paving, cement and other plants). These sectors are mainly excluded from this study.
2. PriceWaterhouseCoopers (PWC) provides annual data on the mining sector. They report 7,922 direct employees for 1999 and 7,990 direct employees for 2000, but these data include only the developed mines that participate in the PWC survey and it excludes most of the exploration sector. In 2000, PWC reports an average salary per employee of $66,300, excluding benefits and $77,800 with benefits. (PriceWaterhouseCoopers, *The Mining Industry in British Columbia – 1999 and 2000*).

Source: B.C. Ministry of Energy and Mines, 1999.

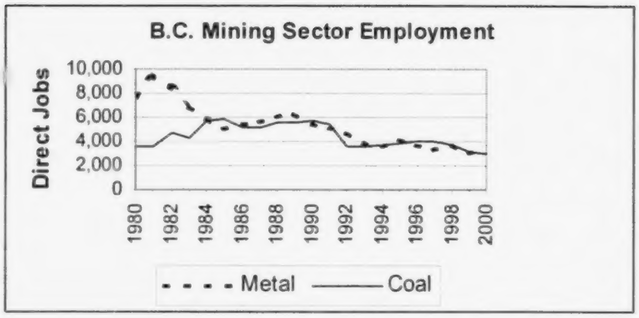
Not reflected in the above data are the suppliers of goods and services to the mining sector in B.C. BC Stats estimates that for every direct job in the mining and oil and gas sector, an estimated 1.66 indirect and induced jobs are generated in other sectors.[13] This compares to an employment multiplier of 1.86 for pulp and paper manufacturing, 1.5 for logging and wood manufacturing and 1.16 for tourism.

MEM summarizes employment in metal and coal mining over the last twenty years. Total metal and coal mining employment in B.C. peaked in 1981 at almost 13,200 and it now hovers at approximately 6,300 employees (excluding industrial mineral mines, exploration, smelting and refining).

---

[13] Represents a straight average of employment ratios (no safety net) for all B.C. regions. Source: Horne, G., *B.C. Local Area Economic Dependencies and Impact Ratios – 1996*, B.C. Ministry of Finance and Corporate Relations, 1999.

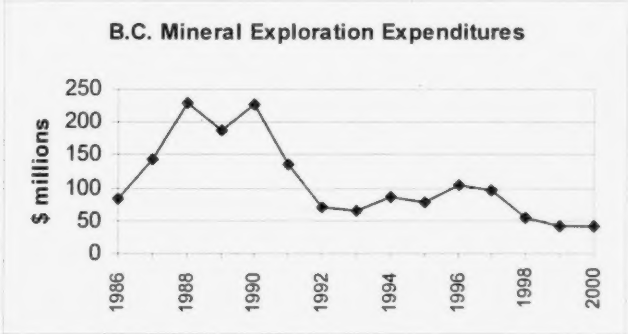
As shown on the graph opposite, metal mining employment declined rapidly in the early 1980s from a high of approximately 9,500 people in 1981, stabilized during the mid to late 1980s and then declined through most of the 1990s, to a low of 3,000 in 1999. A very small increase is expected for 2000. Coal mining employment peaked in 1985 at 5,800 employees and declined to 3,200 by 1999, with a continuing decrease expected in 2000.



Source: B.C. MEM.

In 2000, the B.C. government collected $29 million in B.C. Mining and Mineral Taxes on mining revenues of $2.6 billion (net of transportation and miscellaneous items). Other direct B.C. government revenues from the mining sector include: the B.C. Capital Tax ($5 million), Provincial Sales Tax ($49 million) and other property, income and other taxes ($68 million). In total, the B.C. mining industry paid $176 million in direct taxes to governments including $151 million to the province of B.C. and $25 million to the Government of Canada. In addition, personal income taxes paid through direct employment and other direct payments added another $206 million.[14]

In the last 15 years, exploration expenditures in B.C. were at their highest between 1988 and 1990. Exploration spending in B.C. declined dramatically through 1991 and 1992, recovered somewhat to 1996, and then declined again through 2000. MEM estimates that exploration expenditures of between $150 and $200 million per year are required to sustain the discovery of new mines.



Source: B.C. MEM; Appendix 4 provides more detail.

During the last decade, many Canadian provinces suffered a significant drop in exploration expenditures, including Quebec and Ontario, which with B.C. were traditionally the targets of most of the mineral exploration effort in Canada. Canada's mining exploration effort dropped by half between the late 1980s and 1999/2000 with some of the drop in expenditures in B.C., Quebec and Ontario being offset by increases in exploration effort in the Northwest Territories, Nunavut and Newfoundland.

Between 1986 and 2000, B.C.'s share of Canadian exploration expenditures has ranged between lows of 8% in the last three years (1998-2000) and a high of 29% in 1990. B.C.'s unusually high share of the Canadian exploration effort in 1990 resulted from B.C.'s exploration expenditures remaining at peak levels through 1990 whereas exploration expenditures in the rest of Canada dropped in half between 1988 and 1990. Over the last 15 years, B.C.'s average share of Canadian exploration expenditures has been 15%.

---

[14] **Source**: PriceWaterhouseCoopers, *The Mining Industry in British Columbia – 2000*. Excludes income and payroll taxes paid by the exploration sector and their employees.

Table 13 Provincial Comparison of Exploration Expenditures, 1986-2000

	Exploration Expenditures ($ millions)		**% Change (1987/1990 and 1999/2000)**
	Annual Average, 1987-1990 (recent peak years for B.C.)	**Annual Average, 1999-2000**	
• British Columbia	197	42	79% decline
• Ontario	282	93	67% decline
• Quebec	310	93	70% decline
• Northwest Territories/Nunavut	57	145	155% increase
• Other Canada	218	129	41% decline
Total Canada	1,064	502	53% decline

Note:
Over the last 15 years, the peaks and valleys on a provincial basis differ slightly. B.C.'s exploration expenditures peaked between 1988 and 1990 but for Ontario and Quebec, the peak years are 1987 and 1988, thus explaining the selection of the entire 1987 to 1990 period for demonstrating peak level expenditures. For Ontario, the lowest years were in 1992/1993 but the 1999/2000 levels are also very low. In Quebec, the lowest level was in 2000.

Source: MEM Federal/Provincial Annual Survey of Canadian Mineral Exploration Expenditures. Appendix 4 provides more detail.

These data suggest that the primary factors driving the decline in exploration expenditures in the 1990s were not unique to B.C., although B.C. does appear to have suffered a steeper decline than either Ontario or Quebec.

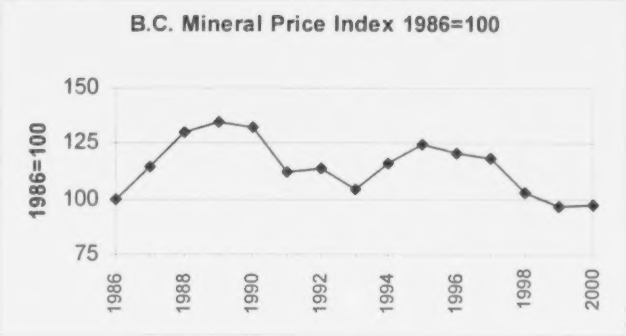
Factors Affecting Mineral Exploration

Some of the factors that have affected mineral exploration in B.C. in recent years include:

- **Mineral commodity prices and US/Canada exchange rates**. These are probably the two most important factors affecting the industry. Mineral commodity prices are very cyclical. For example, the LME Grade A copper price averaged US$ 0.71 in 1999, compared to a recent decade high of US$ 1.33 in 1995 but only US$ 0.62 in 1986. Copper prices have been stronger in 2000/2001.

  MEM has prepared an index of mineral prices for B.C. that includes copper, lead, zinc, gold, silver and metallurgical coal prices. The mineral price index does not take into account general inflation (i.e. prices are in nominal terms).

As shown on the chart opposite, B.C.'s mineral price index for 1999 and 2000 dropped slightly below what it was in 1986, even in nominal dollar terms.



Source: B.C. MEM, 2000; Appendix 4 provides more detail.

The B.C. Mineral Price Index is based on prices in Canadian dollars. In recent years, the low Canadian dollar relative to the U.S. currency has assisted Canadian mining companies in remaining competitive. However, since so many other mineral producing countries have also seen their currency depreciate relative to the U.S. dollar, the low Canadian dollar has not helped the B.C. mining industry as much as it has the forest industry, for example.

- **Land Use Conflicts**. Mining industry officials in B.C. often refer to some key landmark decisions that have in their view affected the state of exploration in B.C. These include the Windy Craggy/ Tatshenshini Protected Area and the Tulsequah Chief mine. The following briefly describes these and other mineral title disputes.

  - **Windy Craggy mine**. In mid-1993, the B.C. government established the Alsek-Tatshenshini Protected Area and by doing so, expropriated a significant copper-cobalt deposit owned by Geddes Resources and its principal shareholder Royal Oak. The project was undergoing an environmental review process and faced significant opposition from U.S., international and local environmental groups because of its proximity to the Tatshenshini River, acclaimed as one of North America's wildest rafting rivers. In August 1995, the B.C. government signed an agreement with Royal Oak outlining a $166 million financing package to compensate for Windy Craggy and provide incentives for Royal Oak to develop other mineral claims in the province, including the Kemess Mine.[15] The mining industry in general was very unhappy with the way events unfolded, arguing that the environmental review process should have been completed before making any decisions on the project.

  - **Tulsequah Chief**. In 1997, the Government of B.C. issued a Project Approval Certificate to Redfern Resources Ltd. to re-develop the Tulsequah Chief deposit. Cominco previously operated a mine at the site in the 1950s and at the time, ore was barged down the Taku River. The project was approved after extensive environmental assessment over three and a half years.[16]

    Following the issue of the Project Approval Certificate, the Taku River Tlingit First Nation

---

[15] It is not clear how much of the benefit of that financing package was in consideration for the Windy Craggy expropriation. **Source**: Discussions with David Green, B.C. Ministry of Employment and Investment, 2001.
[16] Price Waterhouse, *The Mining Industry in British Columbia, 30th Annual Edition*, 1997.

("The Tlingits") applied to have the permit revoked. The most contentious issue is the plan to build a 160 km access road from Atlin in Northwestern B.C. The Government of Alaska (and the EPA) has also opposed the project, mainly because of water quality concerns related to the former mine. In June 2000, the B.C. Supreme Court agreed that there had been procedural errors in the initial environmental assessment, and ordered the Project Committee of the Environmental Assessment Office (EAO) to reconvene and review issues of concern to the Tlingits regarding the proposed access road. The EAO is now proceeding with this review.

- **Expropriation of Other Mineral Titles**. In 1998, Treasury Board approved $5 million to fund the negotiated settlement of all mineral titles affected by PAs. To date, MEM has reached settlement of approximately 55 mineral titles. Approximately 300 mineral titles have been expropriated and MEM is currently negotiating with many more titleholders.[17]

- **Key Legislation**. There have been recent legislation and regulations that have been aimed at clarifying guidelines for conducting exploration and obtaining permits to develop mines outside Protected Areas. These include the Mineral Exploration Code (MEC) and Bill 12, the Mining Rights Amendment Act. The mining industry has been hoping to strengthen the language of Bill 12 to make it clearer that SMZs do not constitute an additional set of more stringent environmental regulations on the industry.

Some of the regional plans make it very clear that mining is an acceptable land use in SMZs but these same plans also include language such as "priority", "emphasis" and "protect" in relation to other resource values, which creates uncertainty. Some of the plans also recognize that certain objectives such as backcountry recreation or wilderness preservation could very well become entrenched over time. The Cariboo-Chilcotin Land Use Plan 90-day final report specifies that "The multi-resource objectives established for SMZs must be able to adapt to increasing and more localized impacts of advanced exploration and mining activities in order to implement government's overall direction that mining is an acceptable land use in these areas"... and that "management expectations must not become entrenched; they must be adaptable to accept a higher level of impact on specific sites from mining activities".[18]

Initially, the Commission on Resources and Environment did not believe that SMZs would have any "significant negative consequences for the mining industry, because the mining industry would have to take the necessary precautions to protect the sensitive values that presently exist within these areas even if there was not a regional land use designation. By identifying the location of these concentrations of sensitive values as SMZs, the industry benefits from advance knowledge of where the values may occur and the expectation that the values should be respected."[19] The interviews conducted as part of this study, however, have highlighted the negative consequences of the SMZ designation on investment and costs, particularly in the M-K region. This is discussed further in the report as part of the interview results.

---

[17] Ministry of Energy and Mines, e-mail dated December 22, 2000.

[18] *Cariboo-Chilcotin Land Use Plan 90-day Final Report*, www.luco.gov.bc.ca.

[19] Source: Commission on Resources and Environment, *East Kootenay Land Use Plan*, 1994.

Economic Impacts of An Average Mine

The mining industry is highly speculative, with inherent risks associated with finding and developing a mine. The B.C. and Yukon Chamber of Mines states that "mines cost over $100 million to discover, …and then another $100 to $500 million more for development".[20] MEM estimates the average economic impacts associated with a new major metal mine as follows:

Table 14 Key Parameters for Average Major Metal Mine

Economic Impact Indicator	Average Parameters for Major Metal Mine
• Number of jobs (Person Years (PYs))	335 jobs (PYs)
• Average mine life	16 years
• Development capital	$392 million
• Average sales revenues	$ 172 million per year

Notes:

1. While the average major mine life may be 16 years, there are often clusters of deposits that allow mining to continue for much longer within a given area.
2. The above analysis is based on three of the 12 major metal mines currently operating in B.C.: Eskay Creek in Northwest B.C. (Homestake Canada – gold and silver), Myra Falls on Vancouver Island (Boliden Limited – copper, zinc, lead, gold and silver) and the Kemess mine northeast of Prince George (Northgate Exploration, copper and gold). In MEM's view, these parameters represent the average size of major metal mines currently operating in B.C.

Source: B.C. MEM, *Issues in the Estimation of Mineral Value in Land-Use Planning*, prepared by Karen Koncohrada, January 2001.

Mineral exploration also has significant employment impacts. BC Stats estimates that every $1 million in exploration expenditures (in constant 2000 $) generates 9.6 PYs of direct employment and another 5 PYs of indirect employment as a result of purchases of goods and services required for exploration.[21] By comparison, MEM estimates that in 1999, the exploration sector generated some 951 PYs of employment (see Table 12). Based on the $42 million in B.C. expenditures for 1999, this represents 22.6 PYs per million dollars of exploration expenditures. However, some of the PYs of employment related to the B.C. exploration sector may reflect exploration expenditures outside B.C. Vancouver is a major financial and technical centre for global mineral exploration and mining.

The mining industry also points out that the mining sector uses very little land base. The B.C. and Yukon Chamber of Mines reports:

- "The B.C. mining sector has disturbed less than 0.1% of the total land base, and much of that has been reclaimed.
- Mining activities generate annual direct revenues of about $150,000 per hectare, compared with roughly $5,700 for forestry and $1,400 for agriculture."[22]

---

[20] B.C. and Yukon Chamber of Mines, *B.C. Mining Sector Interest Statement,* dated February, 8, 2001, from web site www.chamberofmines.bc.ca.

[21] Based on a survey undertaken by Maki and Sunderman for BC Stats; as reported in *Socio-Economic & Environmental Assessment of the Mackenzie Draft Recommended LRMP*, 2000.

[22] B.C. and Yukon Chamber of Mines, Ibid, page 1 of 4.

3.2.2 Base Case Assumptions

The B.C. mining industry experienced declines in employment, production, profitability and exploration effort through much of the 1990s. The lack of exploration effort has raised concern about the future prospects of the mining industry, given that new mines must be discovered and brought into production on a regular basis to offset the depletion and eventual closing of existing mines[23].

Determining the "Base Case" for the mining sector means determining how the mining sector would have developed and what the future prospects would be had there been no SLUP initiatives and no PAS. This complex task would involve forecasting what PAs and other land use designations would have prevailed without SLUPs, and how the various stakeholders would have reacted to ongoing land use conflicts. Rather than attempt this, this study considers the Base Case to be the situation that prevailed in 1991 prior to the PAS and SLUPs. As a result, this study attributes the full impacts of all land use designations after 1991 to those two initiatives. It also attributes any perceived changes in land use conflict, land use efficiencies, resource inventories, stakeholder communication, etc. to those two initiatives.

Some questions to be answered in assessing the impacts of PAs and SLUPs include:

- Were any operating mines affected by SLUPs or the PAS?
- Were any deposits in an advanced stage of development affected by SLUPs or the PAS?
- Were mineral claims affected by SLUPs or the PAS?
- Were areas of high potential mineral capability affected by SLUPs or the PAS?
- Was exploration effort and investment affected by SLUPs or the PAS?
- Was the Windy Craggy decision or the court challenge of the environmental review process for Tulsequah Chief affected by SLUPs or the PAS?
- Was land use certainty affected by SLUPS or the PAS?
- Were the overall operating environment and prospects for the industry affected by SLUPs or the PAS?
- How were government revenues and employment affected?

A combination of quantitative and qualitative data is examined to attempt to answer these questions.

3.2.3 Quantitative Data on Mining Industry SLUP Impacts

Three broad types of quantitative data have been examined for indications of the impacts of SLUPs and the PAS on the mining industry:

- The historical statistics on mineral exploration expenditures in B.C. and Canada;
- The socio-economic impact analyses that were undertaken for each of the SLUPs; and
- Provincial coverage data on mineral capability, mineral tenures and mineral occurrences.

Exploration Expenditures

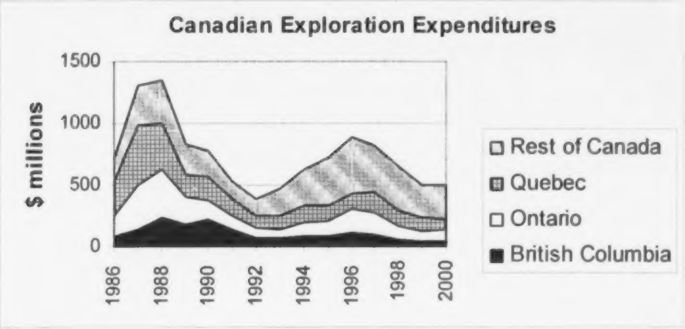
Exploration expenditures in B.C. have dropped significantly over the past ten years. Mining industry officials have stated both publicly and privately that they believe SLUPs and the PAS have played a major role in this decline. The difficulty lies in assessing how much, if any of the decline can be explained by SLUPs and the PAS, and how much is due to other factors such as changes in mineral commodity prices, changes in tax policy and Aboriginal land claims. MEM conducted some statistical analysis on exploration expenditures in Canada and concluded that:

---

[23] This concern is expressed frequently in the annual PriceWaterhouseCoopers survey of the *Mining Industry in British Columbia*, including the most recent 2000 edition.

- 60% to 80% of changes in exploration spending can be explained by commodity price levels and expectations; and
- 20% to 40% can be explained by government policies and other factors.[24]

Within that 20% to 40% explained by government policies and other factors, at least some of the impact in B.C. may be due to SLUPs and the PAS. It is important to note, however, that the largest decline in expenditures occurred in 1991 and 1992, before the results of the SLUPs and before the establishment of the Alsek-Tashenshini PA. The graph opposite shows that Ontario and Quebec have also seen their share of Canadian expenditures decline in recent years.



Source: Ministry of Energy and Mines. Appendix 4 provides more detail.

There is little doubt that mineral prices have been a major factor in the decline of exploration effort in B.C. As displayed earlier, even in nominal terms B.C.'s mineral price index for 1999/2000 is lower than the 1986 level and the 1993 level, the other two years when B.C.'s exploration expenditures were at cyclical lows during the last 15 years. Exploration expenditures in B.C. were $84 million in 1986 and $66 million in 1993.

A very crude approach to measuring the impacts of SLUPs and the PAS on B.C. exploration expenditures is to assume that SLUPs and the PAS are the only unique factors affecting the industry in B.C., and that all other factors affecting exploration in Canada are common to all provinces. Using Ontario as a benchmark, the difference in the extent of the decline in activity between B.C. and Ontario is then attributed to SLUPs and the PAS. Referring to the data in Table 13, had B.C.'s exploration efforts dropped by 67% from the 1987-1990 average, as they did in Ontario, instead of 79%, exploration expenditures in B.C. might now be closer to $65 million instead of the $42 million expended in 2000. However, expenditures would still be less than one third of the annual average spent in 1987-1990.

The above analysis suggests that SLUPs and the PAS may have led to a decline in mineral exploration expenditures in B.C. in the order of $23 million per annum. This represents approximately 15% of the $155 million drop from the annual average of the peak years of 1987-1990 to the 1999-2000 levels. Putting this back in the context of the MEM model for Canada, if 60% to 80% of the drop in B.C. is explained by commodity prices, and 15% is due to SLUPs and the PAS, the remaining 5% to 25% might be explained by other factors such as escalating concerns over Aboriginal land claims or provincial taxation policies.

---

[24] Canadian Intergovernmental Working Group on the Mineral Industry, *Overview of Trends in Canadian Mineral Exploration*, 2000.

Mining industry officials have specifically cited the Windy Craggy and Tulsequah Chief cases as having a negative impact on exploration activity in B.C. The extent to which these cases are related to PAS and SLUPs is not clear, particularly since expenditures were near bottom levels in 1992 before the completion of any SLUP and prior to the Tatshenshini decision. Moreover, while the Windy Craggy decision was certainly associated with PAS and the creation of the Tatshenshini protected area, no SLUP has been undertaken for that region. The Tulsequah Chief case is not directly related to a SLUP either, although in their application to the courts for reviewing the Tulsequah Chief permit, the Tlingits asked the court to note the "expert reports concerning the absence of a regional land use plan and the fact that treaty negotiations... are not concluded."[25] Some have argued that an SLUP might have helped prevent the controversies arising out of the proposed Tulsequah Chief development.

While it is very difficult to say what level of exploration would have occurred without SLUPs, it is even harder to assess whether those efforts might have led to an additional metal mine being developed.

Mining Industry Impacts Noted in the Socio-Economic Analyses for SLUPs

All of the Socio-Economic Analyses (SEAs) conducted as part of the Strategic Land Use Planning process address the impacts of proposed SLUPs on the mining sector in each region of the province, albeit in various degrees of detail. A review of the SEAs shows the following:

- The SLUPs tend to protect un-roaded areas and as a result existing mining jobs are generally not threatened by SLUPs or PAs, at least not immediately. It is the ability to continue to find and develop new mines that has been affected by SLUPs.
- New PAs could affect existing jobs, however, if a new PA prevents the mining of ore zones that continue under a PA (an example may be the Myra Falls Mine, which could be prevented from pursuing ore zones that continue under Strathcona Park therefore resulting in a pre-mature shutdown).
- In general, the SLUPs have attempted to avoid existing coal deposits. For the Dawson Creek LRMP, for example, the SEA states that the impacts from the plan are minimal because most of the identified coal resources remain outside of PAs and SMZs.
- The SEAs identify a few of the more definite prospects that are located in new PAs or SMZs and as a result, may be less feasible to develop. Those specifically identified in the SEAs would add approximately 1,000 jobs if developed:
  - In the Vanderhoof region, some provision was made to develop the Wolf gold and silver deposit in the Entiako Protected Area, if feasible and subject to the environmental process (40 to 50 jobs for 5-10 years). Because of additional constraints applied to this area, however, the economic feasibility of the project may be compromised in spite of the special provisions.

---

[25] Source: Court Decision to *Taku River Tlingit First Nation al. v. Ringstad et al.*, June 28, 2000; also, *Meeting Minutes of September 2000*, Tulsequah Chief Project Committee (from Environmental Assessment Office web site).

- In the Lakes area, the Mac moly-copper deposit is in an SMZ and additional constraints could increase development costs and jeopardize the viability of the project (potential of 150 jobs). Also, the Lindquist/Deerhorn deposit, the region's most promising developed prospect is in the Tweedsmuir Recreation Area. Mining is permitted in the area whereas logging is not, but various constraints on resource development to protect the caribou in the area may also affect the viability of the project.

- The Fort Nelson SEA specified seven developed prospects in the Muskwa-Kechika region. The job potential for four of these seven potential mines adds to 350 jobs for between 10 and 20 years. The SEA does not specify the job potential of the other three prospects. The M-K Management Area designation and associated management strategies may compromise the economic viability of exploring and developing some of these prospects.

- In the Fort St. John area, the Robb-Lake lead zinc deposit was deemed to have the most potential for development (150 jobs for 20 years). This deposit is in the M-K region and the additional guidelines may compromise further development of the prospect.

- In the Cassiar Iskut-Stikine LRMP, the SEA mentions two proposed mines that may be less viable as a result of the SLUP because of higher road access costs and potentially higher reclamation costs should development proceed. These are: the Spectrum gold deposit within the Mount Edziza Recreation Area (75-80 potential jobs for 7 years); and the Red Chris mine which would require road access through a Wildlife Management Area (potential of 200 to 240 jobs for more than 20 years). In both cases, the LRMP made special provisions in an attempt to accommodate the projects, but these provisions do not reduce the land use/ access-related risks to the level that would be associated with a General Management Zone, and therefore could comprise economic viability to an unknown extent (for the Spectrum deposit, a government process was established after the completion of the LRMP to resolve the access issue as it pertains to that deposit). In general, the constraints that were added in the Cassiar-Stikine LRMP are relatively minor, and are less of a concern to industry than the perceived and actual constraints added in the Muskwa-Kechika SMZs for example.

This is not an exhaustive list, however, it provides a general overview of some of the main prospects that have been identified as potentially at risk.

- In most B.C. regions, the SEAs recognized that the guidelines relating to road access and reclamation might be more stringent in SMZs, thereby leading to additional exploration and development costs, which could impact future growth in the mining sector. Some of the SEAs provided data on the extent to which PAs and SMZs contained relatively high potential metallic and industrial minerals. These include Cassiar, Mackenzie, Fort St. James, Dawson Creek, Fort St. John, the Okanagan and other LRMP regions for which SEAs were recently completed. In many cases, the SEAs named the deposits and areas of high mineral potential.

- In the Bulkley and Mackenzie region, the SEAs also reported what percentage of past exploration expenditures were carried out in SMZs and PAs.

- In an effort to recognize the importance of mineral values and the relatively small footprint of mineral exploration and development activities, some of the more restrictive SMZs allow mining exploration and development to continue while disallowing most or all timber harvesting activity.

A major shortcoming of using the SEAs to develop a provincial prospective of impacts is that they typically do not assess the impacts of PAs and SMZs in a consistent manner across different plan areas.

Provincial Coverage Data on Mineral Capability, Mineral Tenures and Mineral Occurrences

The B.C. Ministry of Energy and Mines has developed extensive geological maps of British Columbia using a Geographic Information System (GIS) that shows mineral capability, mineral tenures and mineral occurrences for all of B.C. As part of this project, LUCO has provided a breakdown of these three mining values overlain by land use zone categories recommended by all the completed SLUPs in B.C. The three values are defined as follows[26]:

- **Mineral tenures**: as of January 31, 2001, shows the location of mineral tenures of various types throughout the province. The incidence of mineral tenures in each protected area or resource management polygon is determined using the land use planning map overlays.

- **Mineral occurrences**: these show documented evidence of site-specific mineralization. They may include: producing mines, past producing mines, developed prospects (occurrences with defined grades and tonnages), prospects (occurrences with some indication of dimension) and showings (occurrences that are not sufficiently defined to permit resource estimation). The mineral occurrence database (MINFILE) includes coal, metallic and industrial prospects and showings.

- **Mineral capability**: Mineral capability mapping for B.C. reflects the relative ranking of geological tracts, based on the value of known and assessed undiscovered mineral deposits. For this project, 794 tracts are aggregated to create three broad categories, low, moderate and high. The bottom third of the rankings were called low, the middle third were called moderate and the top third were called high[27].

There are some caveats in using the data:

- Mineral tenures show existing tenures in the various SLUP zones (as at January 31, 2001). Since mineral tenures lapse when inactive, this indicator will likely understate the impacts of PAs. Also, to the extent that SLUPs have affected interest in exploring in B.C., the data may already reflect the SLUP impacts. According to MEM, 'PAs study areas', No Staking Reserves, and other access restrictions which preceded (in many cases by several years) many PA designation decisions resulted in significant forfeitures of tenures, due to difficulties in raising investment dollars for work on these tenures, and due to the perceived risks.

- Mineral occurrence data are updated continually as exploration effort leads to new information and discoveries. Areas in which new exploration is discouraged or prohibited (i.e. protected areas) will remain static in the number of known occurrences, while the number of occurrences grows elsewhere over time.

---

[26] Based on: Holman, Gary, Marvin Shaffer and Associates et al., *Mackenzie Land and Resource Management Plan, Socio-Economic & Environmental Assessment of the "Mackenzie Draft Recommended LRMP"*, 2000.
[27] Don MacIntyre from the B.C. Ministry of Energy and Mines provided advice on the most appropriate way to categorize the rankings for this project. The SEAs completed for various regions used different definitions of high, moderate and low mineral capability.

- Mineral capability shows the mineral potential of B.C. based on our knowledge of the geology, locations of recorded occurrences and known deposits and our understanding of the characteristics of geological settings which host each type of deposit at the time the Mineral Potential Assessment work was completed. New mineral finds, remapping/ reassessment or more detailed mapping and exploration of an area can change our knowledge of its mineral potential. For example, recent finds of diamonds in the Northwest Territories have led to increased exploration for diamonds in many other parts of Canada, including B.C., and diamond showings have been discovered in southeastern B.C. which now requires an updated assessment of that region's diamond potential.
- The mineral capability and mineral tenure data generated on a provincial basis does not directly compare with the analysis conducted at the SLUP level. For example, the Fort Nelson SEA reported that 13% of the land base had high/medium metallic potential (compared to the 5.6% reported in Appendix 4) and that 98% of the land base had high/medium industrial potential (compared to 32% in Appendix 4). The difference is due primarily to the use of different methods to split the rankings into high, moderate or low potential.

The following summarizes the results of the analysis. Appendix 4 provides more detail.

Mineral Tenures and Occurrences

The following table shows the percentage of mineral and coal tenures and mineral occurrences in various SLUP designated land use zones on a provincial basis.

Table 15 Summary of Mineral Tenures and Occurrences

	Province	Planned Area	**Protected Areas in B.C.**				SMZs	Enhanced
			New SLUP PAs	New Non SLUP PAs	Original PAs	Total PAs		
Million Hectares	94,726,166	67,272,198	4,653,559	1,918,328	5,284,664	11,856,551	15,535,418	15,107,289
% of B.C. Land	100.0%	71.0%	4.9%	2.0%	5.6%	12.5%	16.4%	15.9%

TENURES	Total B.C.	% of B.C.	Percentage by Zone					
MINERAL	3,012,263	72.2%	1.0%	0.8%	0.3%	2.1%	23.8%	13.3%
COAL	177,808	97.7%	0.25%	0.0%	0.09%	0.3%	11.5%	31.6%
OCCURRENCES	12,036	67.4%	2.8%	1.3%	2.6%	6.7%	17.8%	6.9%

Source: Prepared by *Pierce Lefebvre Consulting* based on LUCO data.

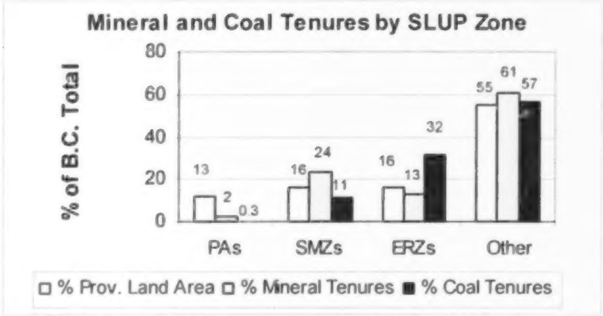
The data in the table suggest that the boundaries of new protected areas (PAs) have generally tended to exclude known mineral occurrences. New PAs (SLUP and non-SLUP) cover 6.9% of the province but include only 4.1% of known provincial mineral occurrences (coal, metallic and industrial).

SMZ designations have not, in general, avoided known mineral occurrences, with 17.8% of the province's known occurrences being located within SMZs, which represent 16.4% of the total provincial land base.

ERZs did not target mineral occurrences with ERZs accounting for only 6.9% of mineral occurrences while representing 15.9% of the B.C. land base.

The data on mineral and coal tenures appear to support anecdotal indications that mineral and coal tenures were avoided, where possible, in establishing new protected area boundaries. As noted earlier, these data suffer from the bias of tenures lapsing where mine development is perceived to be, or is in fact, not possible.

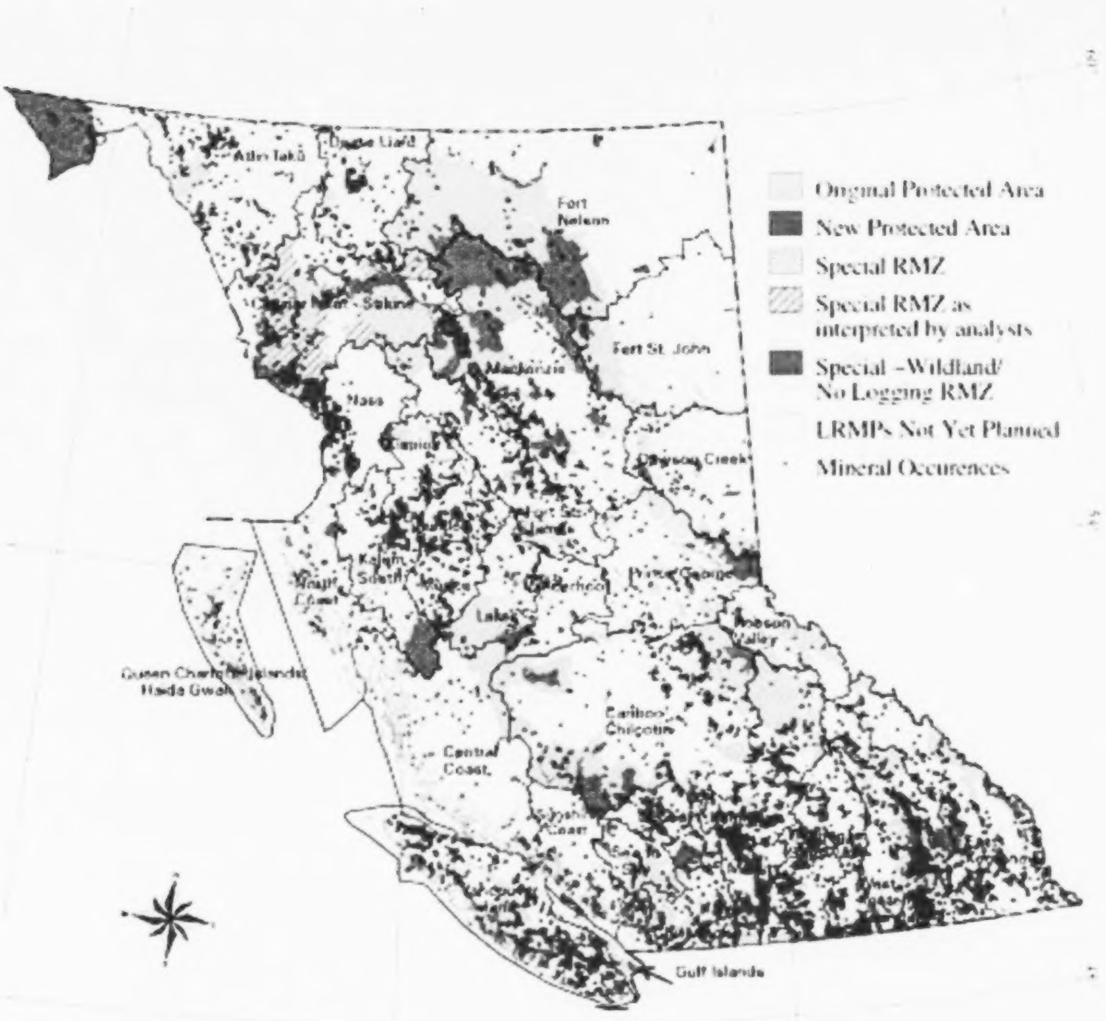
SMZs have not tended to avoid mineral tenures, but have avoided coal tenures to some degree. A relatively high proportion (31.6%) of the province' s coal tenures are situated in Enhanced Resource Development zones (in the Kootenays over 75% of coal tenures are located in Enhanced Zones). The coal tenures that are in SMZs are in the Cassiar-Iskut region (72% of all coal tenures are in SMZs in that region, but many of these SMZs specify that mining can continue as in general zones), Dawson Creek (25%) and Bulkley and other (3%). Some 98% of all coal tenures are in planned areas.



Source: Based on LUCO data.

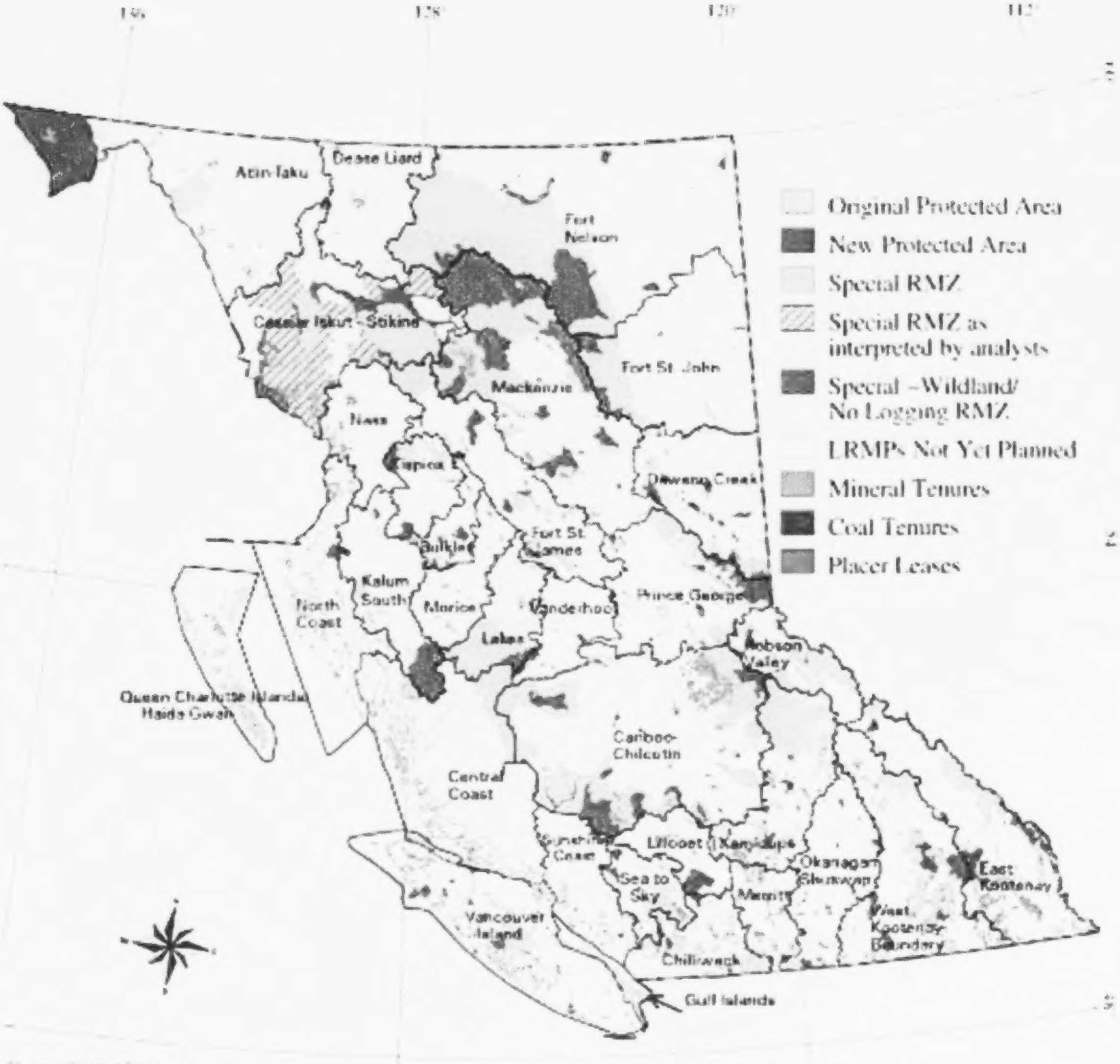
Regional data for mineral tenures and mineral occurrences are available in Appendix 4. The regional information shows that certain regions such as Kootenay-Boundary and the Cariboo-Chilcotin have a relatively larger share of mineral tenures than other more remote and less explored regions such as Mackenzie.

The next two maps show the mineral occurrences (coal and mineral), coal tenures and mineral tenures data for B.C.


Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
LRMPs Not Yet Planned
Mineral Occurences
Atlin Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Fort St. John
Mackenzie
Nass
Dawson Creek
Kispiox
Fort St. James
Kalum South
North Coast
Morice
Lakes
Vanderhoof
Prince George
Robson Valley
Queen Charlotte Islands Haida Gwaii
Cariboo Chilcotin
Central Coast
Sunshine Coast
Gulf Islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Mineral Occurences
January 2001


Atlin-Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Fort St. John
Mackenzie
Nass
Kispiox
Dawson Creek
Bulkley
Fort St. James
Kalum South
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands/ Haida Gwaii
Cariboo-Chilcotin
Central Coast
Sunshine Coast
Lillooet
Kamloops
Okanagan Shuswap
Sea to Sky
Merritt
East Kootenay
West Kootenay-Boundary
Vancouver Island
Chilliwack
Gulf Islands
Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
LRMPs Not Yet Planned
Mineral Tenures
Coal Tenures
Placer Leases

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Mineral Tenures
January 2001

Mineral Capability:

The mineral capability indicator (which is the least tangible of the three mineral impact indicators) shows that the proportions of High, Moderate and Low/No mineral capability in the various SLUP zones are very similar to the proportions of High, Moderate and Low/No capability throughout the total planned area. This suggests that no particular effort was made to target or avoid this measure of mineral capability when establishing the land use zones. Some additional observations can be made:

- New protected areas designated under SLUPs have a somewhat lower proportion of high mineral capability lands than either the provincial or planned area average.
- New protected areas designated by order in council, and not through the SLUP process, have a much higher proportion of High and Moderate mineral capability lands than the province as a whole.
- The mineral capability profile of special management zones (SMZs) designated by SLUPs is very similar to the overall profile for the planned areas.
- The mineral capability profile of the Enhanced zones designated by SLUPs is similar to that of the provincial and the planned area averages, which suggest that high mineral capability lands were not the target in the creation of the Enhanced Resource Development zones.

Table 16 Summary of Mineral Capability Distribution

	Province	Planned Area	Protected Areas (PAs) in B.C.				SMZs	Enhanced
			New SLUP PAs	New Non SLUP PAs	Original PAs	Total PAs		
Area in millions of Hectares	94,726,166	67,272,198	4,653,559	1,918,328	5,284,664	11,856,551	15,535,418	15,107,289
% of Total Area	100.0%	71.0%	4.9%	2.0%	5.6%	12.5%	16.4%	15.9%
MINERAL CAPABILITY: Metallic								
HIGH	24.0%	22.2%	18.2%	36.1%	17.3%	20.7%	22.7%	19.7%
MODERATE	30.2%	28.4%	28.2%	40.4%	35.5%	33.4%	27.0%	29.4%
LOW/NO	45.8%	49.4%	53.7%	23.5%	47.3%	45.9%	50.3%	50.9%
	100%	100%	100%	100%	100%	100%	100%	100%
Industrial								
HIGH	22.1%	22.1%	20.3%	30.1%	24.9%	23.9%	20.3%	15.5%
MODERATE	32.0%	31.9%	42.1%	34.4%	27.5%	34.3%	41.1%	25.4%
LOW/NO	45.9%	46.1%	37.7%	35.5%	47.6%	41.7%	38.6%	59.1%
	100%	100%	100%	100%	100%	100%	100%	100%

Note: The Planned Area includes all SLUP areas (LRMPs and CORE) but excludes the Lower Mainland region
Source: Prepared by *Pierce Lefebvre Consulting* based on LUCO data. Appendix 4 provides more detail.

The mineral capability indicator is the less tangible of the three indicators. It is nevertheless very important particularly since the locations of recorded mineral occurrences correlate strongly with roaded access by virtue of the creation of easier, less costly access to the land base for prospecting and exploration. Also, road building creates new rock exposures previously covered by surficial deposits and soils. New PAs and SMZs are typically un-roaded and as result, they contain fewer recorded mineral occurrences, even though these areas may have the same or similar excellent geology and potential for mineral discovery as other more easily accessible areas.

The following table views the same data from a different perspective. Rather than show what proportions of a given geographical area or land use zone are comprised of the three mineral capability classifications, the table following shows what proportions of the High and Moderate mineral capability lands in the province and the SLUP areas fall into the various zoning designations.

Table 17 Metallic Capability in B.C. and SLUP areas by Zoning Designation

	Provincial Total			**Total SLUP Areas**		
	Total Area (%)	**Areas with Metallic Capability (%)**		**Total Area (%)**	**Areas with Metallic Capability (%)**	
		High	**Moderate**		**High**	**Moderate**
Protected Areas (PAs)						
• SLUP New PAs	4.9	4.0	4.8	6.9	5.6	6.8
• Non-SLUP New PAs	2.0	2.8	2.5	0.4	1.2	0.5
• Original PAs	5.6	4.0	6.5	5.6	3.4	5.8
Sub-Total PAs	12.5	10.8	13.8	13.0	10.2	13.1
• SMZs	16.4	15.5	14.7	22.8	22.7	21.6
• Agriculture/ Settlement/ Private	3.4	3.7	2.9	4.8	5.7	4.3
• Enhanced	15.9	13.1	15.5	22.5	19.9	23.2
• General/ Unclassified	26.3	27.3	25.2	37.0	41.5	37.8
Unplanned Areas	25.4	29.6	27.9			
Total	100	100	100	100	100	100

Note: SLUP areas exclude the Lower Mainland region.
Source: Prepared by *Pierce Lefebvre Consulting* based on LUCO data. Appendix 4 provides more detail.

This table reinforces the observations made from the previous table, but also demonstrates the relative proportions of the overall metallic mineral capability that fall into each type of zone. Thus, while the non-SLUP new protected areas appear to contain a higher than average proportion of High metallic capability land, this affects only 1.2% of the total High metallic capability land in the planned areas.

The mineral capability data has also been compiled for each SLUP area (LRMPs and CORE regions). The data at the individual plan level can be misleading, particularly when it is reported on a percentage representation basis as in the following table. Some of the problems with analyzing the data at the plan level are:

- The constraints applied to individual SMZ vary widely across the regions and within the polygons of a region. Certain SMZs restrict timber harvesting but not other resource developments. For example, in Cassiar, most of the what is referred to as SMZs in the table are general management areas with area specific directions that restrict logging but not mining. Other SMZs, such as the Muskwa-Kechika area, are much more restrictive.
- Some of the plan areas with particularly low mineral values have only a small area of high potential capability and sometimes, it is entirely within a PA or an SMZ.

Nevertheless, the regional data can be used to indicate which regions have the greatest metallic potential and how much of each region's high metallic capability land base is in PAs or in SMZs. The table includes an indicator of metallic mineral richness called the "H & M Ratio". This ratio is the percentage of High and Moderate metallic capability in an individual plan area, divided by the percentage of High and Moderate metallic capability in the province as a whole. The individual plan areas are then listed in the table in order of their relative metallic capability richness (H&M Ratio) ranking.

The Regional Mineral Capability table shows that three areas with high mineral potential include a much greater percentage of high and moderate mineral capability areas in PAs and SMZs than the overall average for all SLUP areas. These are: Lakes (due to a higher percentage in Original PAs), Cariboo-Chilcotin (due to a higher percentage in SMZs) and Mackenzie (due to a higher percentage in SMZs).

Also, in the Cassiar-Iskut, Fort Nelson and Fort St. John regions, virtually all the high mineral capability lands are in SMZs. Those regions have smaller proportions of high and moderate capability areas than the provincial average but the lands that are deemed of high metallic capability are virtually all in PAs or SMZs.

Table 18 Metallic Capability by SLUP Region for PAs and SMZs

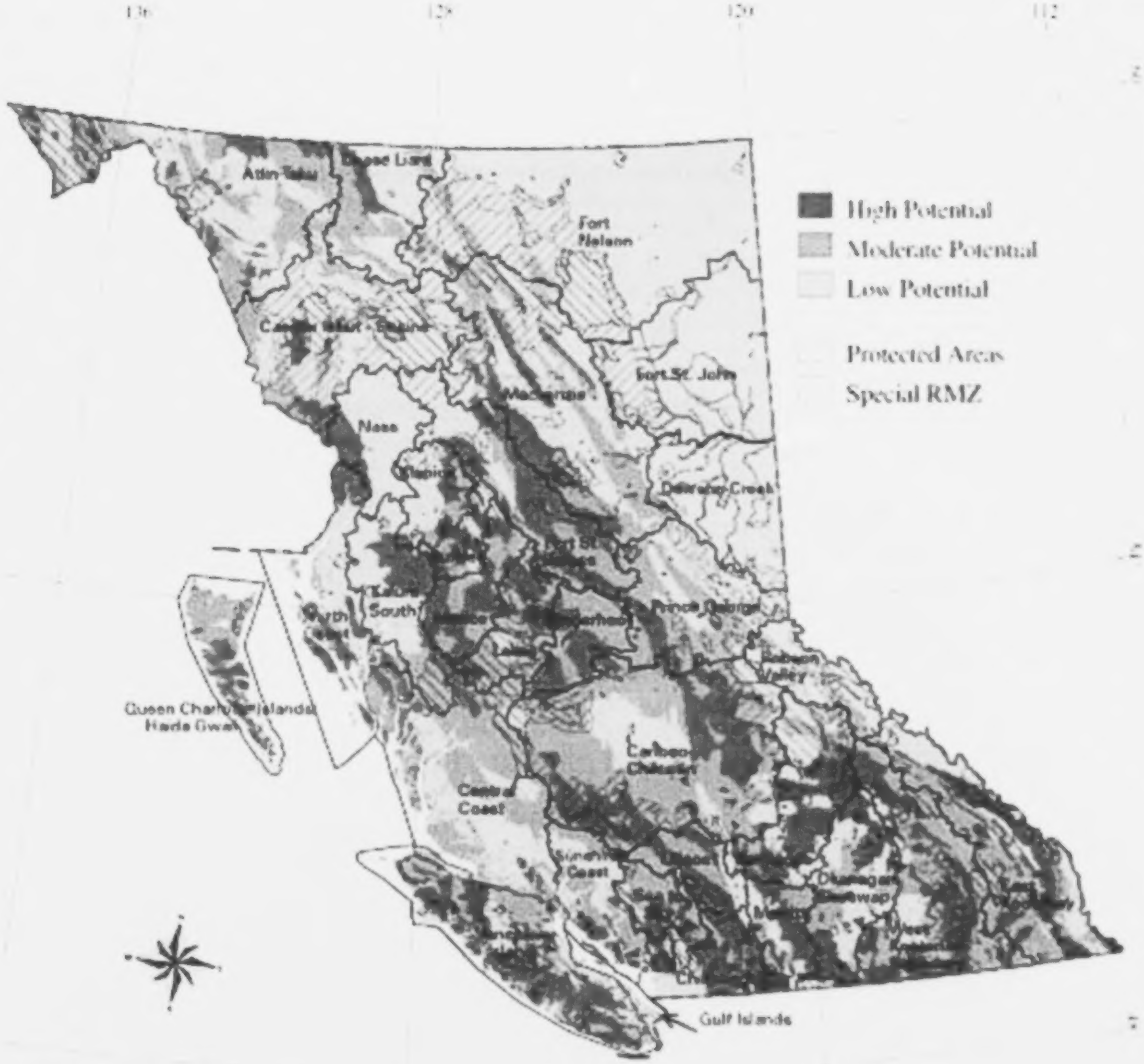
	Relative Richness		**% High Metallic Capability in PAs and SMZs**				
Plan Area	% of B.C.'s Total Area	H & M Ratio (1)	New SLUP PAs	New non-SLUP PAs	Original PAs	Total PAs	SMZs
Vanderhoof	1%	1.8	8%	0%	0%	8%	6%
Lakes	2%	1.7	4%	0%	19%	24%	18%
Vancouver Island	4%	1.6	3%	2%	6%	12%	11%
Kootenay-Boundary	9%	1.5	5%	0%	8%	13%	18%
Bulkley	1%	1.5	7%	0%	0%	7%	25%
Cariboo-Chilcotin	9%	1.5	3%	6%	0%	9%	38%
Fort St. James	3%	1.3	6%	0%	0%	6%	14%
Kamloops	3%	1.2	3%	0%	1%	4%	20%
Okanagan	3%	1.1	8%	0%	3%	10%	0%
Prince George	4%	1.1	3%	0%	1%	4%	5%
Mackenzie	7%	1.0	12%	0%	0%	12%	39%
Total SLUPs	71%	0.9	6%	1%	3%	10%	23%
Kispiox	1%	0.8	2%	0%	0%	2%	27%
Cassiar-Iskut	5%	0.7	7%	0%	1%	8%	92%
Robson Valley	2%	0.3	0%	0%	0%	0%	0%
Fort Nelson	10%	0.1	49%	0%	0%	49%	51%
Fort St. John	5%	0.0	50%	0%	0%	50%	50%
Dawson Creek	3%	0.0	0%	0%	0%	0%	0%

Notes:

1. The H & M ratio is the % of high and moderate capability areas in one region divided by the % of high and moderate capability for the province as a whole.
2. The Lower Mainland is excluded from the SLUP average since that region only has a Protected Area Strategy and not a complete SLUP; For the Okanagan LRMP, all unclassified lands are included as general zones, even though some management guidelines apply to those areas.

Source: Prepared by *Pierce Lefebvre Consulting* based on LUCO data. Appendix 4 provides more detail.

The next two maps show metallic mineral potential and industrial mineral potential for B.C. Appendix 4 provides the detailed data on metallic and industrial capability.

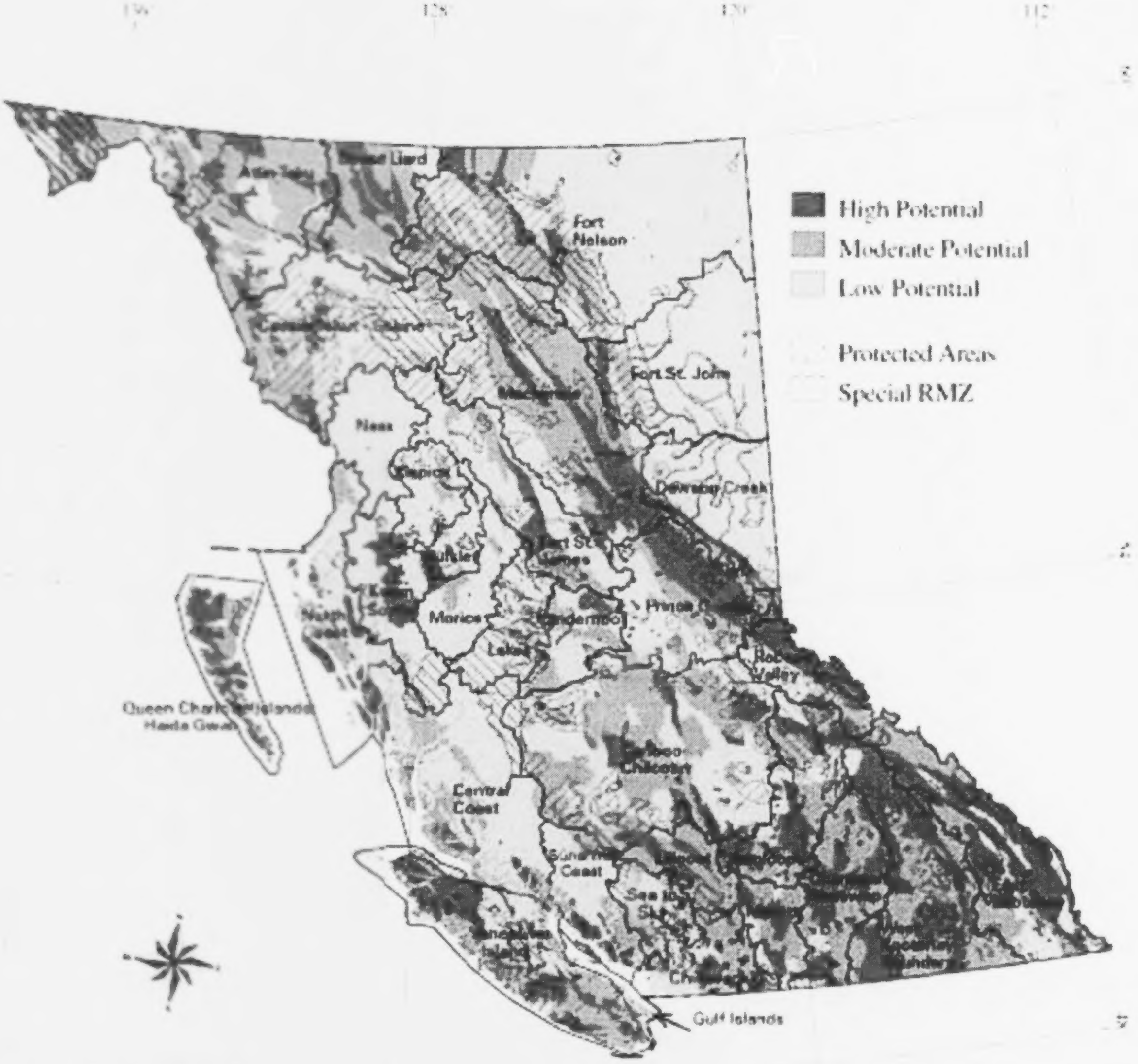

136
128
120
112
Atlin-Taku
Muskwa-Kechika
Fort Nelson
Cassiar Iskut - Stikine
Fort St. John
Mackenzie
Nass
Kispiox
Dawson Creek
Fort St. James
Kalum South
North Coast
Prince George
Robson Valley
Queen Charlotte Islands Haida Gwaii
Cariboo Chilcotin
Central Coast
Sunshine Coast
Okanagan Shuswap
Gulf Islands
■ High Potential
▨ Moderate Potential
□ Low Potential
Protected Areas
Special RMZ

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Metallic Mineral Potential
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants


High Potential
Moderate Potential
Low Potential
Protected Areas
Special RMZ
Atlin-Taku
Fort Nelson
Fort St. John
Mackenzie
Nass
Kispiox
Dawson Creek
Bulkley
Fort St. James
Kalum
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands
Haida Gwaii
Cariboo-Chilcotin
Central Coast
Sunshine Coast
Sea to Sky
Vancouver Island
Chilliwack
Gulf Islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Industrial Mineral Potential
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants

3.2.4 Impact Assessment of SLUPs on Key Indicators

This section summarizes the economic impacts of SLUPs on the mining sector. The analysis is based on a review of quantitative data and approximately 12 interviews with industry representatives. These include:

- Five large mining companies employing approximately 6,800 people, or 71% of the 9,542 mining employees in B.C. (including the Cominco smelter but excluding Alcan).
- Three small exploration companies.
- Two industry associations.
- A geology consulting firm.
- An investment firm that raises capital for junior companies.
- A large Canadian mining company that no longer explores in B.C. but continues to explore in Ontario and elsewhere in Canada.

Other interviews were conducted with government representatives in the mining sector. The results of these interviews are summarized later in the report.

Five of the twelve B.C. mining industry representatives have been directly involved in the development of SLUPs with 2 having been involved in more than one SLUP. In general, the interviews provide a broad regional coverage.

The following table summarizes the results of our analysis. More detail is provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
What would have happened to the mining industry without SLUPs	Ten interviewees offered their views regarding what would have happened in the mining industry in B.C. without SLUPs. All agreed that without SLUPs, there would have been a better climate to obtain financing for speculative exploration. One interviewee mentioned that the coal sector in B.C. was not affected significantly by SLUPs as coal deposits are known and they were kept mainly in general zones. The Tatshenshini did not result from SLUPs but most interviewees associate the Windy Craggy/ Tatshenshini decision with the government's policies on land use. All of the interviewees believe that the Tatshenshini was mainly a political decision. Three interviewees believe that a balanced and fair process may have led to a different decision on the Tatshenshini. However, some interviewees questioned whether a consensus could have been reached, and if not, the issue would have been resolved at the political level. Most interviewees believe that Windy Craggy would not have been grand-fathered by an SLUP. Half believe that Windy Craggy had a chance of obtaining approval through the Environmental Assessment Process. One commented that while the original proposal may not have succeeded, ultimately, a better mine development would have been re-introduced and the deposit would likely have been developed. Many interviewees mentioned the damage to the mineral exploration sector and the investment climate of the Tulsequah Chief court challenge. In their court challenge, the Tlingits infer that a regional land use plan might have been useful in the review of the Tulsequah Chief proposal and associated road access. However, interviewees in the

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on the* ***Mining Industry***
	mining industry see SLUPs as creating more hurdles rather than assisting in dispute resolution.
Impacts of PAs and SMZs on mineral capability	For the SLUP areas (excluding the Lower Mainland), the new PAs (SLUPs and non-SLUPs) have protected 6.8% of areas with high metallic capability and 7.3% of areas with moderate metallic capability. With original PAs, this brings the total SLUP areas of high metallic capability that are in PAs to 10.2% and the areas of moderate metallic capability in PAs to 13.1%. (For all of B.C., 10.8% of high metallic areas and 13.8% of moderate capability areas are in PAs.) The provincial data imply that SLUPs have protected slightly fewer areas of high mineral potential and slightly more moderate potential metallic areas than the overall provincial average of 6.9% for new PAs. Approximately 23% of the high metallic capability areas covered by SLUPs are in SMZs, which is about the same proportion of the gross land base in the SLUP regions that is in SMZs. However, there are some significant regional differences. For example, in the Cariboo-Chilcotin and the Mackenzie area, almost 40% of the high mineral areas are in SMZs. In Mackenzie, this tracks the approximately 40% of the region's total land area that is in SMZs but in the Cariboo-Chilcotin, only 25% of the region is in SMZs. The PAs and SMZs have had a very limited impact on the coal industry. Only 0.3% of coal tenures are in PAs and approximately 11.5% are in SMZs. The coal tenures in the SMZs are mainly in the Cassiar-Iskut region, where there are no existing coal mines, and the "SMZ" constraints are relatively minor.
Impacts on mining exploration expenditures	All of the interviewees believe that SLUPs and the PAS have had a negative impact on exploration expenditures in B.C. • Mineral exploration has continued near existing mine sites but more speculative exploration has essentially stopped. • Obtaining speculative financing for mineral exploration in B.C. has become virtually impossible. • Almost all interviewees mentioned the impacts of protecting the Tatshenshini (Windy Craggy) and while this linked more to the PAS than to SLUPs, the decision is attributed to the then existing government's conservationist policies. Many interviewees provided other examples of deposits with significant mineral potential being set aside in Protected Areas or located in SMZs. • All of the interviewees believe that SLUPs have affected B.C.'s mineral exploration sector, and as a result, they believe that PAs and SMZs have negatively affected the development of new mines. The data suggest that exploration expenditures have fallen dramatically during the 1990s in most parts of Canada, including B.C. The decline in B.C. has been somewhat more pronounced than in Ontario or Quebec, possibly as a result of land use planning and protection issues. The extent to which the incremental decline can be attributed to SLUPs cannot be accurately measured.
Impacts of PAs on exploration	Five companies indicated having been directly affected by PAs: two companies had mineral tenures in what are now PAs and one industry representative has mineral

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
expenditures and potential	claims that he believes are now too close to a park to ever be successfully developed.
Impacts of SMZs on exploration expenditures and potential	All of the interviewees indicated that the SMZ designation negatively affected the mining industry. Exploration continues in SMZs only where companies have well defined prospects. Financing for exploration has been very difficult and SLUPs are being viewed as a significant factor explaining this downturn. Being able to continue exploration in an SMZ is not sufficient, companies require a high degree of confidence that a mineral deposit, if found, could be mined. SMZs were created in part to limit human encroachment and road access around PAs. In that environment, all those interviewed believe that mines, and especially open pit mines have very little or no potential of ever being approved for development in SMZs. Many interviewees mentioned the Muskwa-Kechika SMZ as having significant mineral potential. Mining is in theory permitted, however, the former B.C. Premier has referred to it as the "Serengeti of the North" and advertised it as a protected area as large as Switzerland. Canadian companies no longer exploring in B.C., partly as a result of the M-K region being designated as a Management Area, include large companies such as Cominco and Teck Corporation but also smaller exploration companies. The mineral capability data show that the Mackenzie LRMP has high metallic capability and that 39% of the high metallic capability areas are in SMZs, much higher than the SLUP average of 23%. Most companies interviewed as part of this study have moved exploration away from SMZs. When moving away from SMZs, large and medium size companies typically move their exploration activities to other jurisdictions. Small exploration companies are often self-employed individuals who develop exploration programs using highly speculative financing. For those small companies, the lack of exploration capital essentially puts them out of business. For example, one small company used to carry out $1.5 million a year in exploration in B.C. compared to between $10,000 and $15,000 in 2001. One interviewee mentioned that across the various regions of the province, the Cariboo region might be the most manageable from a mining perspective. The quantitative analysis shows that as much as 38% of the high metallic capability areas are in SMZs in that region. However, the guidelines in the SMZs in the Cariboo region may not be as stringent as in the M-K region. One interviewee indicated that SMZs have not affected the B.C. coal industry. Coal deposits are well known within B.C. and most, if not all were excluded from SMZs. This is supported by the quantitative analysis as approximately 12% of all coal tenures are in SMZs (and only 0.3% are in PAs). By comparison, 23% of all SLUP areas are SMZs and 13% are in PAs.
Mining exploration in B.C. compared to	Exploration expenditures in BC have dropped relative to exploration expenditures elsewhere in Canada. The interviewees were asked to comment on the extent to which this relative decline could be attributed to SLUPs.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
other regions in Canada	All the interviewees believe that SLUPs were a determining factor in explaining the drop in B.C. exploration expenditures relative to the rest of Canada: • Six out of 11 believe that the relative decline is entirely or almost entirely due to SLUPs and the PAS; • One believes that SLUPs and the PAS are responsible for more than half of the relative decline; and • 4 out of 11 believe that SLUPs and the PAS can account for between 10% and 50% of the decline. Most interviewees believe that the mineral geology does not explain the relative decline in exploration expenditures. Some indicated that B.C. was a mature region of the world in terms of exploration potential. Others pointed to the relatively recent discovery at Eskay Creek and the recent activity in the Merritt area as examples of the geology in B.C. still offering significant potential. Many of the interviewees noted that Aboriginal claims affect the B.C. mining sector, but that this has been the case for many years and cannot explain the relative decline in B.C.'s share of Canadian exploration expenditures over the last decade. None of the interviewees mentioned that the Aboriginal claims issues significantly worsened throughout the 1990s, however, this may be the result of not having specifically questioned the interviewees on the impacts of Aboriginal issues on investment. The 1990s in B.C. were characterized by treaty negotiations, landmark court decisions regarding aboriginal title and greater obligations to consult before tenuring or alienating Crown land. It is possible, however, that the mining industry attributes some of the First Nations impacts to the PAs and SLUPs. For example, First Nations have played a key role in the land use conflict relating to Tulsequah Chief and many interviewees mentioned this land use conflict as a deterrent to investment in B.C. mineral exploration.
Impacts on level of land use certainty	Ten interviewees out of 12 believe that SLUPs have decreased the certainty of land status in B.C., although most interviewees view the impacts of Windy Craggy/Tatshenshini as part of SLUPs. In their view, SLUPs have increased land use uncertainty for the following reasons: • SMZs have decreased the likelihood of developing a mine, if found. • The Higher Level Plans and the recent Tulsequah Chief court decision have increased the likelihood of court challenges of mining companies' plans and operations. • There is no finality regarding protected areas as environmentalists continue to pressure for more protected areas. • Aboriginal claims continue to contribute towards land use uncertainty. One interviewee believes that SLUPs have had no impact on land use certainty. One interviewee believes that SLUPs slightly increased certainty in general zones.
Impact on investment	All of the respondents believe that SLUPs have had a negative impact on investment in the mining sector and in particular in B.C.'s exploration sector. Mineral exploration has continued near existing mine sites but more speculative exploration work has

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
	essentially stopped. Obtaining speculative financing for mineral exploration in B.C. has become virtually impossible. Other than mine site exploration, most mining companies no longer explore in B.C. including the larger ones such as Cominco, Teck, Placer Dome and Noranda, but also smaller exploration companies such as Ecstall Mining.
Impacts on resource inventory developed by governments	Ten interviewees commented on whether SLUPs have led to improvements in government resource inventories. All except for one interviewee believe that SLUPs have had no impact on mineral resource inventories developed by governments. A few of the interviewees noted that the negative impacts of SLUPs on exploration expenditures have worsened inventories developed by MEM since they typically depend on exploration work by the private sector. Also, MEM did not obtain additional resources for developing better inventories and for playing a significant part in the land use process. Some of the interviewees noted that SLUPs led to MELP developing better inventories of environmental resources.
Impacts on existing mines	All of the existing mines in B.C. have been precluded from PAs and if placed in SMZs are not affected from an operational perspective.
Impacts on mine approval process	Seven interviewees chose to comment on whether SLUPs help or hinder the mine approval process. All those seven interviewees believe that SLUPs hinder the mine approval process in SMZs. In general zones, some interviewees believe that SLUPs might help the approval process but most believe that SLUPs would have no impact.
Impacts on costs	Most companies indicated that SLUPs have led to cost increases in the exploration sector. However, for all interviewees, the cost impacts of SLUPs pale in comparison to the negative impacts of SLUPs on land use certainty. The extra permit and road access costs are not what has stopped exploration. Of the nine interviewees who chose to comment, 7 believe that SLUPs have led to increases in costs. Only two said the cost impact was larger than 10% and most said they did not know what might be the magnitude of the impact. Examples where additional costs will be incurred are increased permit costs and diminished road access.
Impacts on local/provincial conflicts	Only one interviewee believes that SLUPs helped reduce conflicts with environmental groups. All others believe that SLUPs have not helped to decrease conflicts between the mining industry and environmental and other stakeholder groups. Approximately one third of interviewees believe that SLUPs have worsened conflict between the mining industry and other stakeholder groups. SLUPs have empowered environmental groups and this has worsened conflict. One interviewee believes that conflicts have risen between the forest and mining industries as SLUPs have increased pressure on the land base.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
Impacts on communication between stakeholders and between government agencies	Most of the interviewees believe that SLUPs have had no impacts on communication between the industry and stakeholder groups. Two interviewees believe that SLUPs have led to more conflicts and distrust between stakeholder groups. One interviewee believes that SLUPs have increased communication between agencies, but only slightly. Four believe that SLUPs led to a worsening in the communication between agencies while four believe that SLUPs have not changed communication. Some of the interviewees believe that MELP plays too large a role in land use planning in B.C. and that the Ministry of Energy and Mines (MEM) has too few resources to adequately represent the interests of the industry. Only six interviewees chose to comment on whether SLUPs have led to cooperation and efficiency in land management. Of these, four said that SLUPs led to a worsening of the situation. In the Muskwa-Kechika, an area with significant mineral potential, the management board is viewed as simply more bureaucracy.
For those areas that have not yet had an SLUP what are the perceived benefits and costs of having one	The interviewees believe that areas that do not have SLUPs do not show higher or lower exploration expenditures than areas with SLUPs. In general, the interviewees believe that regions that are not within an SLUP will soon be subject to land use planning. As a result, they believe that the anticipation of SLUPs in those areas is negatively affecting mineral exploration.
Implications of differences between BC land use plans and those of other jurisdictions, eg. Alaska, Alberta, Manitoba, Ontario	All but one company interviewed as part of this study indicated that they are also involved in the mining sector outside B.C. Ontario is generally viewed as being more favourable to mining than B.C. Ontario had a Protected Area process but the mining industry perceives that in Ontario, there is more certainty regarding land use outside protected areas. Contrary to Ontario, in B.C., investors are not confident that a mine, if discovered, would ever be allowed to develop even in a general zone. Even with a land use climate that is viewed by B.C. companies as more favourable to mining, annual exploration expenditures in Ontario have averaged $94 million in 1999/2000, down 67% from the 1987-1990 annual average of $282 million. Other jurisdictions mentioned as having a land use process that leads to greater investor confidence include Quebec, Alaska, Mexico, South America and Australia. While some of the other jurisdictions mentioned are perceived to be better than B.C. in terms of land use certainty, some jurisdictions are deemed worse than B.C. in that respect. This includes the Eastern slopes of the Rockies south of Calgary, and Yukon. One interviewee said that approval for an exploration permit that might require three weeks in Ontario might take three months in B.C. but three years in the Yukon. Some interviewees mentioned that other jurisdictions in North America are similar to B.C. including Nevada (this is somewhat surprising since a recent survey of mining

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Mining Industry***
	executives by the Fraser Institute indicates that Nevada has the most favourable policy climate of the 35 jurisdictions included in the survey).[28] Some mentioned that other jurisdictions in Canada are headed in the same direction as B.C.

In summary, the socio-economic impacts of SLUPs on the mining sector are as follows:

- SLUPs and the PAS appear to have tried to make provisions for maintaining the mining industry in B.C. Indicators that are more readily understood in terms of measurement and short term impact (tenures and occurrences) appear to have been carefully considered in the land use planning and zoning process. The more vague indicator of perhaps longer term potential (capability) is the least tangible of the three mineral impact indicators and may be as a result of this, it appears to have been given less consideration, or has been heavily discounted in impact analyses.

- SLUPs and the PAS have designated an additional 6.8% of High Metallic capability areas as PAs resulting in 10.8% of the province's high metallic capability areas being set aside for parks. There will be some loss of provincial mining activity associated with those PAs.

- SLUPs have not negatively affected the coal sector significantly as most deposits are well known and have been kept outside PAs or SMZs. A high proportion of coal tenures are located in Enhanced Resource Development zones, particularly in the Kootenays. Some 3,200 people are directly employed in 8 coal mining operations in B.C. (1999).

- Existing mines are generally not impacted by land use plans. As a result, PAs and SLUPs are not expected to result in immediate job losses at existing operations although in some cases, the location of PAs or SMZs may constrain efforts to extend mine life. In 1999, the metal and industrial mineral sector and the associated smelting sector directly employed 5,400 workers (excluding coal mining and mineral exploration). In 2001, there are 9 active metal mining operations in B.C. (down from 12 in 1999) and while these are not immediately threatened, all are scheduled to close in the next 5 to 10 years if there is no increase in known ore reserves or commodity prices. There is therefore a need to find other mines to replace them to maintain mining jobs in B.C.

- PAs and SLUPs have affected mineral exploration, perhaps by say, an annual $23 million dollars in reduced exploration effort (assuming that no other factors unique to B.C. would result in lower exploration expenditures than Ontario or that no other factor unique to Ontario would have favoured that province's mining industry). In 1999, mineral exploration accounted for 951 direct jobs. Another $23 million dollars might have generated approximately 200 additional PYs of direct employment (based on 9.6 direct PYs per million dollar of expenditures). This excludes the indirect and induced employment that would be created.

- Reduced exploration effort reduces the likelihood of additional mines being discovered and brought into production (MEM estimates that between $150 and 200 million in annual exploration expenditures are required to maintain the current number of operating mines). On average, for all planned areas, SLUPs and the PAS have resulted in some 10% of the lands with high metallic potential being located in PAs and another 23% in SMZs. The percentage of high metallic areas in PAs is much higher in certain regions, for example in the Lakes area where 24% of the high metallic areas are in PAs. Similarly, the percentage in SMZs is much higher in some areas such as in Mackenzie (39%) and the Cariboo-Chilcotin (38%). The SEAs have specifically identified 7 or 8 deposits that may now be less likely to be developed due to SMZ or surrounding PA designations. These have the potential to provide approximately 1,000 jobs if and when development becomes economically viable.

---

[28] The Fraser Institute, *Annual Survey of Mining Companies, 2000/2001*, 2001.

3.3 *Oil and Gas Industry*

3.3.1 Overview of the B.C. Oil and Gas Sector

The B.C. Northeast is the only region in the province that currently produces commercial quantities of oil and gas. The major communities in the Northeast include Fort St. John, Fort Nelson and Dawson Creek. The B.C. oil and gas sector started developing in the 1950s and, in 1957, the first gas pipeline from the Peace River district to Vancouver was completed. The province owns the majority of oil and gas rights in B.C., as most land grants issued after 1891 reserved all minerals, including oil and gas, to the province. The Province issues various tenures that provide the rights to explore for oil and gas and develop reserves through public tender.

The Northeast region includes the Northwest part of the Western Canada Sedimentary Basin. There are other areas in B.C. that may become productive in oil and gas.[29] These include:

- The Queen Charlotte Basin, Winona Basin and Tofino Basin on the West Coast of B.C. The provincial and federal governments have issued moratoria on offshore drilling and these regions have been closed to drilling since 1972. Prior to the moratoria, some 25 wells were drilled without commercial success.

- The Georgia Basin east of Vancouver Island and in the Fraser Valley. There is little potential for oil but there may be some potential for natural gas, although wells drilled to date have not been sufficiently deep to evaluate the basin's potential.

- The Fernie Basin and Rocky Mountain Trench in the Southeast. Over 30 wells have been drilled, some showing oil as well as gas.

- The Bowser Basin, Nechako Basin, Quesnel Trough and Whitehorse Trough in the Central Interior. Resource assessment studies indicate potential for dry gas reserves.

B.C. also has significant potential for Coalbed Methane (CBM). CBM is similar to conventional natural gas but is produced from low pressure underground coal formations rather than from underground sandstone or carbonate rock formations. Coalbed methane potential exists in many areas of the province including parts of Vancouver Island, the Interior of B.C. and the B.C. southeast.[30]

For the purpose of this study, the impacts of SLUPs on the oil and gas sector are reviewed only for the Northeast region, which includes the Dawson Creek, Fort St. John, Fort Nelson and Mackenzie Planning Areas.

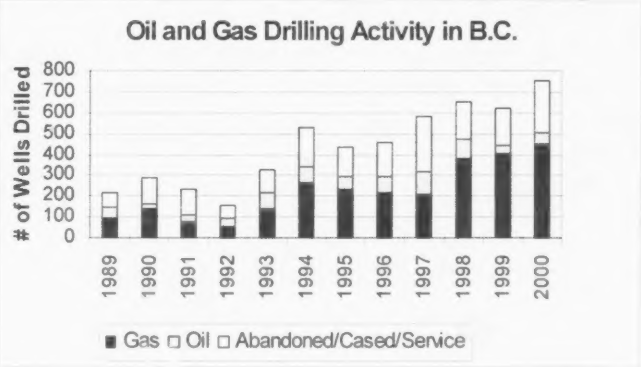
The Ministry of Energy and Mines (MEM) reports statistics on the B.C. Oil and Gas Sector. The upstream segment of the industry (i.e. exploration and well head production) is the most sensitive to land use designations. The mid-stream segment of the industry, which relates to the gathering and processing of oil and gas, and the downstream segment of the industry, which relates to the delivery of product including oil refining and petrochemicals, are less sensitive to strategic land use management initiatives.

---

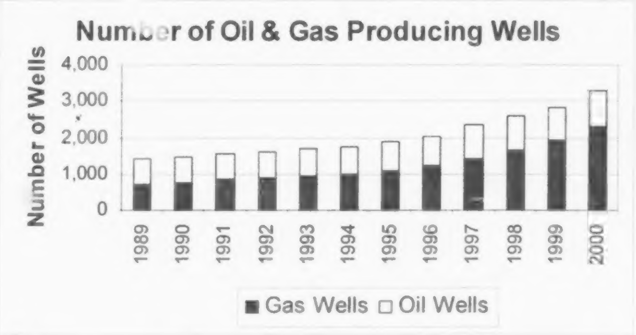
[29] **Source**: *Oil and Gas in British Columbia, Statistics and Resource Potential*, B.C. Ministry of Energy and Mines, 2000.
[30] Source: B.C. Ministry of Energy and Mines, www.em.gov.bc.ca, 2001.

There are approximately 250 companies involved in exploration and wellhead production in B.C., most of which operate from Alberta. Some of the major companies in the upstream segment of the industry include Petro-Canada, Shell Canada Ltd., Canadian Hunter Exploration Ltd., Canadian Natural Resources Ltd. (CNRL), Ranger Oil Ltd., and Talisman Energy Inc. Companies included in the mid-stream and downstream segments include Westcoast Energy Inc. (gathering, processing and transportation), B.C. Gas Inc. (and its subsidiaries) and the refineries in the Lower Mainland (Chevron) and Prince George (Husky).

In 1998, the B.C. oil and gas sector generated an estimated 14,500 direct jobs in B.C. (excluding gas retailing) of which 5,300 were in the upstream segment of the industry.[31] More recent estimates of employment in the upstream industry are as high as 7,000 direct jobs (2000), mainly in the Northeast region of B.C.[32]



Natural gas has grown in importance in the last 15 years. For example, the number of producing gas wells in B.C. has more than tripled between 1989 and 2000. During that same period, the number of successful gas wells drilled rose from an average of 102 wells per year over the first 5 years, to 353 wells per year over the last 5 years. Some 753 wells were drilled in 2000. The acceleration in gas-objective drilling activity has been particularly strong over the past three years.



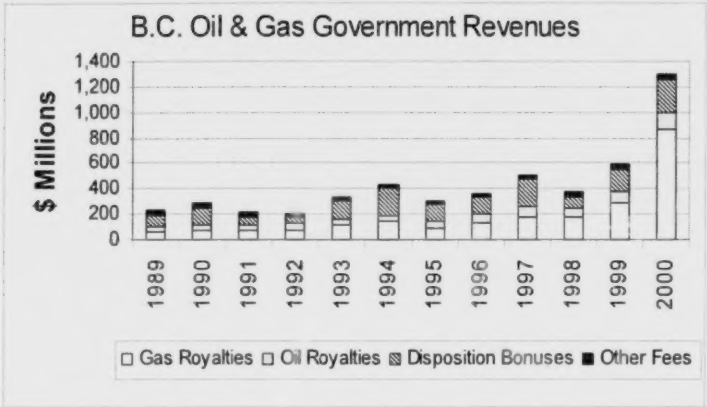
Source: B.C. MEM.

The increased oil and gas production has translated into increased government revenues. Between 1989 and 2000, royalties from gas and processed products have gone from $60 million to $865 million, while royalties from oil products have nearly tripled from $46 million to $136 million.

---

[31] KPMG, *Overview of the British Columbia Oil and Gas Industry*, prepared for the Canadian Association of Petroleum Producers, Westcoast Energy Inc. and the B.C. Ministry of Energy and Mines, 1998.
[32] Government of B.C., *Oil and Gas Overview*, January 12th, 2001.

In 2000, the oil and gas sector generated $1.3 billion in direct payments to the B.C. government, up from $228 million in 1989 and $587 million in 1999. Included in the government revenues are Disposition Bonuses, which are earned through the auction of tenure rights to the highest bidder. While Disposition Bonuses have fluctuated with market conditions over the past 12 years, the average for the first 5 years of the period was $92 million per annum, compared with an average of $173 million per annum over the last 5 years.



Source: B.C. MEM.

Factors that have affected the oil and gas sector in recent years include:

- **Increases in Natural Gas Prices**. This has been a main factor affecting the B.C. natural gas sector in the last two years. The annual average price for natural gas (Alberta Plant Gate, before transportation) has increased from just under $2.00/GJ in 1998 and $2.5/GJ in 1999 to $3.5/GJ in 2000 (January to September). The last time that this price exceeded $2.5/GJ was between 1992 and 1995 and during those years, the annual average price never exceeded $2.75/GJ.[33]

  North American gas prices depend on a variety of factors including the U.S. economy, transportation costs, weather (hot weather results in more use of air conditioning and cold weather means more heating needs), the cost of other energy sources, the demand for cleaner burning fuels, increasing use of natural gas for electricity generation (particularly as the hydro-electricity sector experienced capacity and other challenges) and pipeline capacity. Availability of pipeline capacity was an important factor as anticipated increased demand in the eastern U.S. and more recently in the U.S. Pacific Northwest and California had resulted in construction of additional pipeline capacity in recent years.

- **Significant Finds in the B.C. Northeast**. In the last two to three years, some of the gas wells drilled in B.C. have led to very significant discoveries, and have produced gas in volumes and at rates that are 15 times greater than newly spudded gas wells in Alberta. For example, one interviewed company has recently drilled a well that indicates initial production capacity of over 30 million cubic feet per day (by comparison, an average well would have an initial production volume of 2 million cubic feet per day). A typical well in Alberta produces about 500,000 cubic feet a day (approximate daily production), whereas a typical well in B.C. produces about 1.25 million cubic feet a day.[34]

---

[33] **Source**: Canadian Association of Petroleum Producers, *Natural Gas Prices in the North American Market*, 2001.

[34] There are many differences between B.C. and Alberta and this is not intended to be a comprehensive review of those differences. For example, Alberta is a "mature" basin in terms of exploration and development with over 200,000 wells drilled compared to B.C.'s 12,000 wells. Also, Alberta has many shallow low production rate wells but they are also less costly to drill.

- **Oil and Gas Initiatives**. In 1998, the B.C. government introduced the Oil and Gas Initiative (OGI) to encourage B.C.'s oil and gas sector to expand and make it easier for oil and gas firms to do business in B.C. These have led to changes in the regulatory cost and royalty structure in B.C. and have helped make B.C. more competitive. Initiatives undertaken as part of the OGI have included:
  - **Oil and Gas Commission (OGC)**. In 1998, the B.C. government created the OGC. The OGC's mandate is to serve as a single approval agency for oil and gas companies exploring in B.C.
  - **Oil and Gas Roads Initiative**. In 1998, the B.C. government budgeted approximately $103 million over 5 years to improve the conditions of the public roads infrastructure in the B.C. Northeast. Road improvements will affect some 575 km of highways thereby reducing the duration of the rural road bans for heavy vehicles during spring break-up. Road improvements should reduce the costs of moving drilling rigs within the region, reduce delays and the costs of rigs sitting idle, and expand the number of usable rig-days.[35]
  - **Royalty System**. Also in 1998, the B.C. government announced the implementation of a series of royalty changes for both natural gas and crude oil. These encourage the development of wells that are on hold or are not major producers as well as encourage best environmental practices.
  - **First Nations Consultations**. In 1999, the Province of B.C., seven of the Treaty 8 First Nations and the Oil and Gas Commission signed a Memorandum of Understanding which defines a framework for consultation regarding the impacts of oil and gas sector related activities on Treaty 8 First Nations' treaty rights, and helps support the Treaty 8 First Nations.
- **Requirement for Pre-Tenure Planning in the Muskwa-Kechika (M-K) Management Area**. In 1997, the B.C. government designated the M-K region, as a management area comprised of SMZs and PAs. Before new oil and gas tenures in the M-K region can be issued, MEM and other stakeholders have to develop pre-tenure plans that identify sensitive resource values with corresponding objectives and strategies to support environmentally sensitive resource development. MEM estimates that the M-K area holds gas reserves worth up to $10 billion dollars.

  In 1995, the first pre-tenure plan was developed for the Upper Sikanni River area. As noted on the MEM web site, as of March 2001, several oil and gas tenures have been issued in the Upper Sikanni (part of the M-K area) and one successful gas well has been drilled, with further exploration planned over the next few years. (By comparison, there are currently about 3,000 producing gas or oil wells in B.C. and, in 1999, some 405 gas wells were drilled in B.C.). A second pre-tenure plan in the Besa Prophet River area has been under development since 1997 and should be completed shortly. The B.C. Government has targeted $1.56 million over the next two years to develop wildlife inventory and initial preparation of six additional pre-tenure plans.

---

[35] BriMar Consultants Ltd., *Review of Evaluation Template: Oil and Gas Roads Initiative*, prepared for the B.C. Transportation Financing Authority, the Ministry of Energy and Mines, and the Treasury Board, 2000.

3.3.2 Base Case Assumptions

The oil and gas sector in B.C. has seen a frenzy of activity since 1997 and this seems to be continuing into 2001. Virtually all of the oil and gas activity is taking place in the Northeast of the province in areas that have been designated in LRMPs as either General or Enhanced Resource Management Zones (RMZs). There were more wells drilled in B.C. in the year 2000 than in any other year in B.C.'s history with the number of producing oil and gas wells more than doubling over the last ten years.

The M-K pre-tenure planning requirements have constrained the activities of the oil and gas sector in that area. However, it is difficult to assess the net impact of SLUPs on industry activity given the extraordinary growth that has occurred over the past several years. It is possible that, through SLUPs, the establishment of Enhanced RMZs has allowed greater activity in some areas of the Northeast.

Determining the "Base Case" for the oil and gas sector means determining how the sector would have developed and what the future prospects would be had there been no SLUP initiatives and no PAS. This is a very difficult task and involves forecasting what PAs and other land use designations would have prevailed without SLUPs, and how the various stakeholders would have reacted to ongoing land use conflicts. Rather than attempt this, this study considers the Base Case to be the situation that prevailed in 1991 prior to the PAS and SLUPs. As a result, this study attributes the full impacts of all land use designations after 1991 to those two initiatives. It also attributes any perceived changes in land use conflict, land use efficiencies, resource inventories, stakeholder communication, etc. to those two initiatives.

The next sections review the impacts of SLUPs and the PAS on various indicators of drilling and other oil and gas activity.

3.3.3 Quantitative Data on Oil and Gas Sector SLUP Impacts

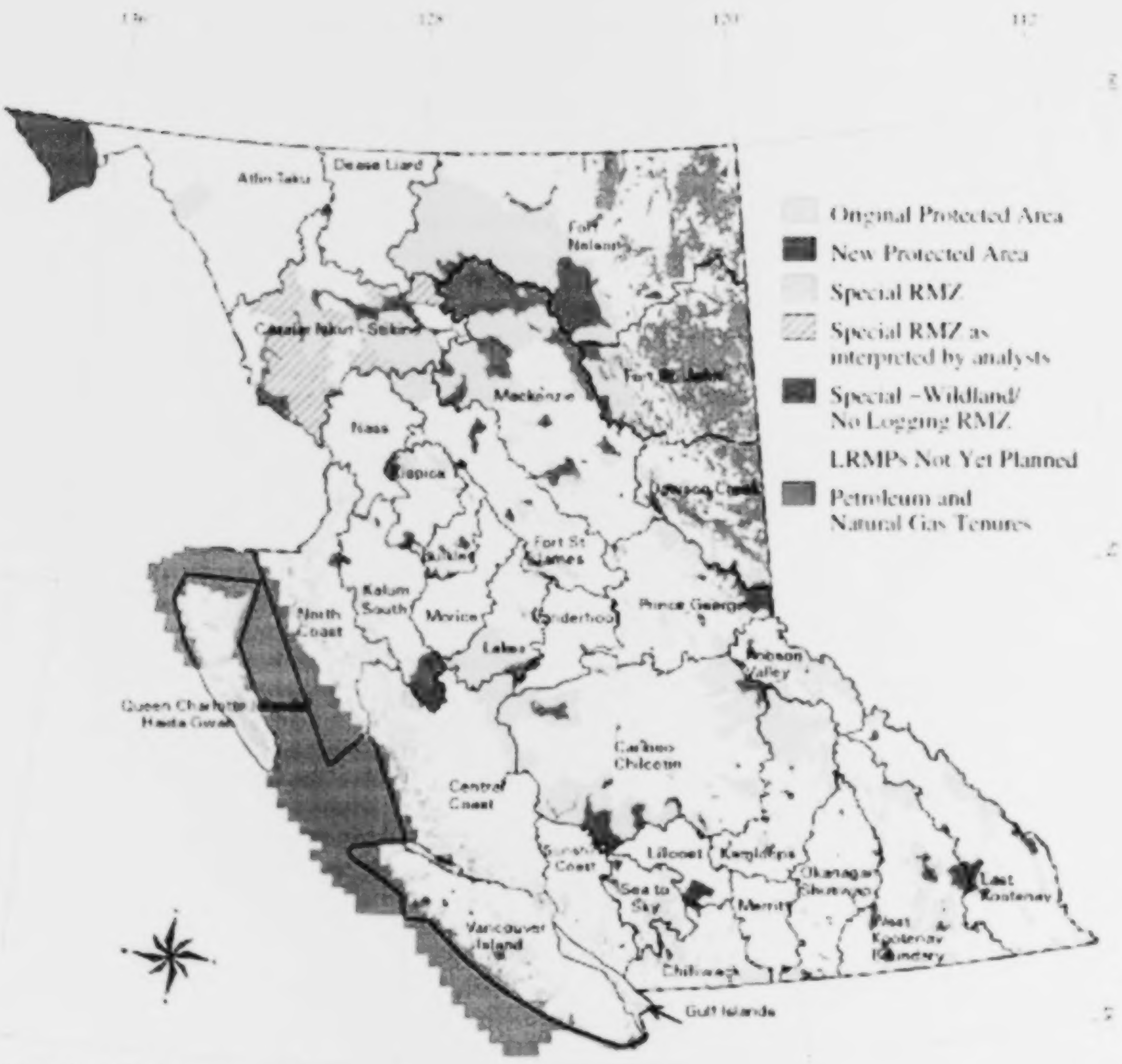
For the purpose of this study, LUCO provided oil and gas tenures by type of zones, effective January 2001.

Table 19 Oil and Gas Tenures By Type of Zone

	Oil and Gas Tenures (LUCO Data)	
	Hectares	% By Zone
Protected Areas		
• New SLUP PAs	24,262	0.4%
• New Non-SLUP PAs	0	0%
• Original	439	0%
Sub-Total PAs	24,701	0.4%
SMZs	380,241	6.5%
Agriculture/ Settlement/ Private	710,344	12.1%
Enhanced Resource Zones	2,669,581	45.3%
General	2,106,765	35.8%
Unclassified/ Not yet planned	0	0%
Total	5,891,632	100%

Note: Tenures are effective January 2001. Source: LUCO.

The map on the page following shows the LUCO data on oil and gas tenures by type of zone.


Atlin Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Mackenzie
Fort St. John
Nass
Dawson Creek
Kispiox
Bulkley
Fort St James
Kalum South
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands Haida Gwaii
Cariboo Chilcotin
Central Coast
Sunshine Coast
Lillooet
Kamloops
Okanagan Shuswap
East Kootenay
Sea to Sky
Merritt
West Kootenay Boundary
Vancouver Island
Chilliwack
Gulf Islands
Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
LRMPs Not Yet Planned
Petroleum and Natural Gas Tenures

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Petroleum and Natural Gas Tenures
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants

The petroleum and gas tenure data show that PAs account for only 0.4% of oil and gas tenures. Moreover, existing oil and gas tenures in new protected areas have typically been "grand-parented". The Province of B.C. has also raised $26 million from the auction of exploration rights (tenures) under select PAs for access by directional drilling from outside the PAs with no surface disturbance within the PAs (Source: MEM).

The data also show that while 6.5% of oil and gas tenures are in SMZs, some 45.3% are in Enhanced Resource Zones (ERZs) with the balance being in general and other zones. Most of the 6.5% of oil and gas tenures in SMZs are in the M-K region and are therefore subject to delay due to pre-tenure planning requirements.

The LRMP socio-economic analyses (SEAs) for Dawson Creek, Fort St. John, Fort Nelson and Mackenzie specifically address the impacts of SLUPs on proven and potential oil and gas reserves. The following table summarizes some of the impacts for the total Northeast area:

Table 20 Proven and Potential Oil and Gas Reserves by Type of Zone

	Hectares	Existing PAs	New PAs	SMZs
Proven Gas:				
• High Proven Gas	332,219	0.05%	1.0%	2.7%
• Moderate Proven Gas	174,981	0%	0.3%	5.0%
Proven Oil:				
• High Proven Oil	32,974	0%	0.4%	13.8%
• Moderate Proven Oil	32,898	0%	0%	4.6%
Potential Gas:				
• High Potential Gas	9,498,475	0.5%	9.9%	16.7%
• Moderate Potential Gas	4,378,870	0%	1.9%	8.8%
Gas Tenures	5,164,865	0%	0.6%	4.9%
Total Area of Plans	23,894,451	2.1%	8.1%	27.4%

Notes:

1. Includes Dawson Creek, Fort St. John, Fort Nelson and Mackenzie plan areas. The data are based on the SEA analysis completed for each region and there may be inconsistencies between regions regarding the resource reserve classification breakdowns.
2. The data represent the location of pools in the mid-1990s and as a result, do not consider the expansion of those pools with new drilling or the addition of new pool discoveries.
3. The data for gas tenures by type of zone are slightly different than the LUCO data on the previous table but the differences are inconsequential. Oil and gas tenures lapse after their term expires unless oil or gas are discovered and the LUCO information is more recent than the SEA data.

Source: Ministry of Employment and Investment; Appendix 5 provides more detail.

As shown on the above table, the main impact of the new PAs on the oil and gas resource has been to reduce access to lands containing high potential gas reserves. The new PAs have had virtually no impact on proven oil reserves and a very limited impact on proven gas reserves.

The table also shows that the main impact of SMZs also falls on potential gas reserves. Almost 17% of high potential gas reserves and 8.8% of moderate potential gas reserves are in the SMZs. However, in the Dawson Creek, Fort St. John and Fort Nelson planning areas, high and moderate potential gas reserve areas cover some 13.5 million hectares, or approximately 77% of the total plan area of 17.5 million hectares. Oil and gas tenures in SMZs have been subject to delays relating to tenure sales, exploration expenditures and potential government revenues, as well as any incremental costs of operating in SMZs.

While the percentage of proven and moderate oil reserves in SMZs are also significant, the number of hectares in question is much smaller relative to the large area with high and moderate gas potential, so that the overall impact is less significant.

LRMP socio-economic assessments for Dawson Creek, Fort St. John and Fort Nelson recognized the impacts of SLUPs on potential gas reserves and estimated what this might mean in terms of jobs and government revenues over the following 20 years. This impact analysis was conducted prior to the recent surge in drilling activity in the natural gas sector. The combined results are nevertheless useful to show the magnitude of impacts on potential gas reserves, jobs and government revenues.

Table 21 SLUP Impacts on Potential Gas Reserves, FTEs and Government Revenues

SLUPs Impacts for Northeast Region (Note 1) **(Includes estimated Forest Practices Code impacts)**	**Total**	**%**
Potential Gas Reserves (trillions of cubic feet)	Trillions of cubic feet	
• Maximum gas reserves	52.6	
• Forest Practices Code	1.4	-3%
• Impacts of new PAs	3.2	-6%
• Impacts of LRMP strategies	4.1	-8%
• Net gas reserves	43.9	-17%
Job Impacts (average Full-Time-Equivalents over 20 years):	FTEs	
• Maximum job potential	1,859	
• Impact of Forest Practices Code	66	-4%
• Impacts of SLUPs (new PAs and LRMP strategies)	277	-15%
• Net job potential	1,516	-18%
Jobs in area at time of analysis	1,380	
B.C. Annual Government Revenue Impacts (over 20 years - Note 2):	$ millions per year for 20 years	
• Impacts of Forest Practices Code	$11	
• Impacts of SLUPs (new PAs and LRMP strategies)	$60	
Government revenue from oil and gas:		
• At time of analysis (1996-1999 analysis based on 1994 data)	$423 million	
• 1999	$ 587 million	
• 2000	$1.3 billion	

Notes:

1. Includes Dawson Creek, Fort St. John and Fort Nelson Planning Areas; excludes impacts for Mackenzie as these were not estimated in the SEA for that region.
2. The government revenue impacts represent an annualized stream of income for the next 20 years, based upon a net present value approach that uses a discount rate of 6%.

Source: SEAs for Dawson Creek, Fort St. John and Fort Nelson. Appendix 5 provides more detail.

The table shows that the impacts of new PAs on gas reserves have been estimated at 6% of the total potential gas reserves of 52.6 trillion cubic feet for that region, or 3.2 trillion cubic feet. The impact of the Forest Practices Code is estimated to be a 3% reduction in gas reserves to reflect the higher costs of meeting incremental requirements for logging plans for roads, seismic surveys, operational restrictions in riparian management areas and added requirements for roads. LRMP management strategies outside of protected areas are estimated to reduce the potential gas reserves by 8%.

The table shows what the job and government revenue impacts might be of the estimated gas reserve reductions. The impact assessments anticipated a growing natural gas industry in B.C. (although probably not the rates of growth that have occurred over the past three years). The table shows that at the time of the analyses (1996-1999), SLUPs were expected to constrain the growth in direct gas exploration jobs for B.C. residents by about 15% (277 jobs per year) over a 20 year projection period. Year to year impacts would likely ebb and flow with oil and gas industry cycles. For example, 277 jobs represented about 5.2% of the 5,300 total upstream jobs in 1998. If the upstream jobs had grown to 7,000 by the year 2000, and SLUP impacts remained proportional, the impacts may be more in the range of 366 jobs during this period of more intense drilling activity.

Similarly, the analysis estimates what might be the SLUP impacts on government revenues from crown royalties and bonus bids. The impacts are estimated at $60 million per year in foregone revenues over the next 20 years. This represents an annualized net present value for the foregone production royalties and land bonus bid revenues, using a 6% discount rate. (Appendix 5 provides more detail on the methodology used in the Socio-Economic Analyses for estimating the foregone revenues).

3.3.4 Impact Assessment of SLUPs on Key Indicators

This section summarizes the economic impacts of SLUPs on the oil and gas sector. The analysis is based on a review of the quantitative data and 5 interviews with representatives from the following organizations:

- Three Alberta-based oil and gas companies operating in B.C., two of which are large Canadian companies and one which is an international company with relatively smaller operations in B.C.;
- The Canadian Association of Petroleum Producers; and
- The Oil and Gas Commission.

Other interviews were conducted with government representatives at the Ministry of Energy and Mines (MEM) and are summarized later in the report.

Two of the companies reported the number of employees (excluding contractors) and, together, they employ 80 upstream oil and gas workers in B.C. The third company reported employing 200 people in B.C., but this includes contractors. In all three cases, these employment figures exclude downstream employment. None of the interviewees have been directly involved in the development of SLUPs, although one of the industry representatives is now a member of the Muskwa-Kechika (M-K) Management Board.

Two of the three interviewees have had some involvement in the M-K region and are familiar with SMZs. This is by design as we specifically targeted companies that have been involved in that region. In fact, most operators do not operate in SMZs or the M-K.

The following table summarizes the results of our analysis. More details are provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Oil and Gas Industry***
What would have happened without land use planning	Four interviewees commented on what would have happened to oil and gas exploration and development without SLUPs. Of these, three believe that the oil and gas industry would have developed differently without SLUPs. • High activity areas have not been affected as these areas are mainly in ERZs or in General Zones, except that there may be more drilling in some regions than there

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the*** ***Oil and Gas Industry***
	would otherwise be. • SLUPs have led to delays in accessing the M-K oil and gas potential reserves. Without SLUPs, there would have been more activity in the M-K region. As one company indicated, instead of having two wells in that region, they might have had 4 or 5. The quantitative analysis supports the views expressed in the interviews. SLUPs have had limited impacts on proven oil and gas reserves. The main impacts of SLUPs are on potential gas reserves.
Impacts of New PAs and SMZs on investment (i.e. petroleum exploration expenditures)	All of the respondents believe that SLUPs have had little or no impact on the level of investment but that they have resulted in significant delays in obtaining drilling and other permits in the M-K region. Land use related delays are very costly to the oil and gas sector because natural gas prices are currently high but expected to decline. Also, the oil and gas sector in B.C. is often forced to operate only in the winter using ice roads and as a result most of the activity takes place over a 4 to 5 month period. In that time frame, a one-month delay can result in a one-year delay. Four out of 5 interviewees mentioned that the delays in completing pre-tenure planning in the Muskwa-Kechika (M-K) have affected the industry. Delays can also result in diversion of exploration budget dollars to other areas or jurisdictions and can result in loss of these investments to B.C. as economic conditions or company priorities change from year to year.
Impacts on proven and potential reserves	• The new PAs have had virtually no impact on proven oil reserves and only a limited impact on proven gas reserves. • The main impact of PAs and SMZs has been on potential gas reserves (high and moderate potential). • Almost 17% of lands with high potential for gas reserve discoveries and 8.8% of lands with moderate potential for gas reserve discoveries are in the SMZs. • The foregone opportunities resulting from new PAs and SMZs might result in 15% fewer FTEs and a loss of $60 million per year in government revenues (crown royalties and bonus bids). There will be no loss of current jobs and current government revenues in the immediate term. The industry is expected to grow but the SLUP impacts on potential gas reserves may slow the growth in natural gas production. • The impact analysis was conducted prior to the recent surge in drilling activity and the discovery of highly productive gas wells. The potential reserves in the SMZs will not be precluded from development but, under less compelling market conditions, the costs of exploration and development may become prohibitive.
Impacts of new PAs and SMZs on known oil and gas reserves and gas tenures	The three companies interviewed as part of this process were not directly affected by the PAs recommended by SLUPs. Virtually all of the traditionally high activity oil and gas fields in the Northeast of B.C. are in General or Enhanced Resource Management Zones (RMZs). Two out of three companies interviewed as part of this process have been negatively affected by the SMZ designation for the Muskwa-Kechika (M-K) region (however, by design, we selected companies that have been involved in the M-K). The SMZ

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the*** ***Oil and Gas Industry***
	designation is creating delays in having the lands posted for bid, in obtaining drilling permits and in getting transportation permits and gaining access. Pre-tenure planning is taking longer than expected and this is reducing the ability to operate in that region. The oil and gas sector in B.C. will not shy away from operating in the M-K area once pre-tenure planning is complete provided that markets remain strong and that this region remains competitive in terms of risks, cost and reward.
Impacts on likelihood of potential reserve additions	Proven oil and gas reserves have been kept outside PAs, and PAs have not directly affected any oil and gas companies. Companies have been more affected by the SMZ designation. Three out of five interviewees believe that SMZs will negatively affect the development of the oil and gas sector in B.C., whereas two believe otherwise. Three interviewees believe that SLUPs will affect the likelihood of oil and gas reserve additions as SLUPs will impact where companies will be able to explore in the future. Two interviewees noted that the main impact has been to delay exploration until pre-tenure planning is complete in all of the M-K area and, as a result, SLUPs have mainly affected the timing of oil and gas reserve additions.
Impacts on operating costs	SLUPs have not had impacts on drilling and other costs in the General Zones. All of the interviewees indicated that SLUPs have led to increases in drilling costs and road access costs in the SMZs. The two interviewees that provided estimates of the cost increases said that drilling costs are between 10% and 20% higher in the SMZs. Examples of why SMZs may result in higher costs include possible directional drilling requirements, strict rules about road building and access, possible restrictions to operate only during the winter months and restrictions regarding pipeline location. All of the interviewees mentioned the costs of regulatory delays. The higher costs have typically not affected investment significantly because the current market conditions are allowing industry to absorb the costs.
Ability to mitigate impacts through directional drilling	All of the interviewees believe that there may be some potential to use directional drilling to mitigate the impacts of SMZ management prescriptions. However, directional drilling can only be used to avoid small heritage sites and other environmentally sensitive areas, since the target horizon cannot be displaced more than about 2 km from the drilling site. It cannot be used to avoid a large PA or sensitive area. Directional drilling can increase drilling costs significantly depending on distance and depth of the drilling (one interviewee said the costs for drilling up to 2 km away from the actual target might increase drilling costs by 30% or more).
Impacts on resource inventories	Three interviewees chose to comment on this issue. They all believe that SLUPs have not led to changes in oil and gas inventories developed by governments. All mentioned that SLUPs have led to better inventories for surface resources.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the*** ***Oil and Gas Industry***
developed by governments	
Impacts on level of land use certainty	Four out of five interviewees believe that SLUPs have had a positive effect on the certainty of land status in B.C. and the other interviewee believes land use certainty has remained the same. Three of the five interviewees mentioned that the operating guidelines in the SMZs are not well defined and this is causing some uncertainty regarding land use.
Impacts on local/provincial conflicts	Four of the interviewees believe that SLUPs have helped in reducing conflicts between the oil and gas sector and various other stakeholder groups. Two people mentioned that the M-K Board and the permitting approval process in the M-K region helped reduce conflicts between the oil and gas sector and environmental groups. SLUPs helped create a forum to handle conflicts. One interviewee mentioned that SLUPs may lead to increased conflicts by creating expectations that certain parties can potentially obtain compensation from the oil and gas sector, for example guide outfitters or trappers.
Impacts on communication between industry and stakeholders and within government agencies	Three of the interviewees believe that SLUPs have had a positive impact on communication between the industry and government agencies and the other two believe that SLUPs have had no impact. Most of the interviewees could not comment on whether SLUPs have led to more communication between the industry and stakeholder groups. None of the interviewees was personally involved in any of the SLUPs (although one interviewee is now on the M-K Board). Only one interviewee believes that SLUPs have led to better communications among government agencies. The others believe that SLUPs have had no impacts. Issues mentioned include conflicts between the Oil and Gas Commission and the various agencies, and that MOF, MELP and MEM tend to work independently. Two interviewees are hopeful that SLUPs may ultimately lead to more cooperation and efficiency in land management at the agency level.
Implications of differences between B.C. land use plans and those of other jurisdictions	All of the interviewees provided comments on differences between B.C. and Alberta. Alberta is very different than B.C. in that Alberta is much more developed and most areas have year round access. Three of the five interviewees mentioned that Alberta also faced some pressure from environmental groups in terrain similar to the B.C. Northeast. One interviewee mentioned that the Northwest Territories/ Nunavut have a much more cumbersome permitting process than B.C. because of the dual government in those regions (i.e. National Energy Board and territorial government).

3.4 Tourism/Recreation

3.4.1 Overview of the Tourism Sector[36]

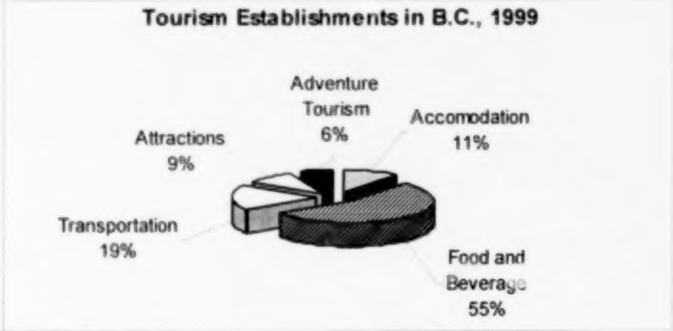
The broad definition of the tourism sector includes all activities that pertain to travelling regardless of the motivation for the trip, whether it is business or pleasure. By international convention, this definition is usually applied to measure the economic contribution or impact of the tourism industry. Tourism BC, an agency of the provincial government, estimates that tourism contributed $4.9 billion to the provincial GDP (4.8% of GDP) and provided 110,800 jobs in 1999 (7.6% of the provincial labour force).[37] BC Stats reports the average wage per part time and full time tourism job for 1999 at $21,971.

The majority of tourism activity is classified as "front country" tourism and does not have a strong or direct linkage to crown land use. Front-country tourism includes most tourism that is highway and/or community-based, e.g., most accommodation and food services, tourism-generated retail spending, golfing, down-hill skiing, and other attractions in or near established communities. While these businesses are not directly related to crown land policies, some of them are at least somewhat reliant on appropriate crown land use policies (e.g., visual quality, provision of parks, etc.) or at least upon preserving the reputation of "Super, Natural" B.C.

Tourism that tends to have a stronger linkage to SLUPs is commonly known as "back-country tourism", including activities such as wildlife viewing, white-water rafting, back-country hiking/camping, kayaking, heli-hiking, sport-fishing, and other activities that tend to rely on relatively pristine surroundings. Other terms such as "ecotourism", "adventure tourism" and "outdoor tourism product", are also used to define some or all of these activities.

Backcountry tourism accounts for between 4% and 9% of the total tourism sector depending on what is included as part of the sub-sector and whether jobs, revenues or number of establishments are used as the indicators.

Tourism Establishments in B.C., 1999



Note: Transportation includes travel agencies.
Source: Tourism B.C., *The Value of Tourism*, 2001.

Tourism BC estimates that ecotourism (excluding hunting) accounts for approximately 6% of tourism establishments in B.C. (1,101 out of 17,075) and 4% of all tourism jobs in B.C.[38].

---

[36] The overview of the tourism sector was based on notes prepared by the Ministry of Sustainable Resource Management (MSRM) titled *The Impacts of Strategic Land Use Plans on the Tourism Sector in B.C.*, 2001.

[37] BS Stats reported employment of 106,830 for 1999, down from 109,490 for 1998. However, Statistics Canada reported errors in the reporting of the accommodation sector and Tourism B.C. reports employment of 110,800 for 1999. Employment includes full time and part time jobs but excludes self-employed individuals. **Source**: Tourism B.C., *The Value of Tourism*, February 2001; also, BC Stats, *Tourism Sector Monitor, August/December 2000*, Ministry of Finance and Corporate Relations, www.bcstats.gov.bc.ca.

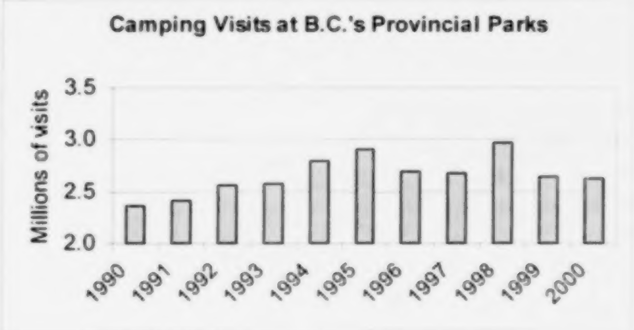
In 1994, a study of the outdoor tourism product estimated visitor revenues of $813 million. The bulk of those revenues were related to provincial parks (48%), outdoor accommodation (20%) and hunting (18%). The balance or 14% ($112 million) was associated with "adventure type activities" such as marine activities, trail riding, hut-to-hut activities and non-hunting guiding activities. [39]
Although a relatively small sector of the B.C. tourism industry, ecotourism/ adventure tourism is nevertheless a growing sector. According to Tourism BC, the World Resources Institute has concluded that "nature travel" is increasing by 10% to 30% annually. However, the same factors affecting the broader tourism industry in B.C. also affect ecotourism. These include:

- **Overall Economic Climate**: As a percent of the provincial GDP, the tourism sector peaked at 5.2% in the mid-1980s due to the very high visitation to Expo 86. In percentage terms, it has yet to fully recover from the significant drop experienced in 1991. Tourism includes all travel by B.C. residents, including business travel, and is dependent on the overall economic strength of the province. Also, since non-B.C. residents accounted for 52% of all overnight visits in B.C. in 1999, the strength of the economy in other Canadian provinces, the United States and the rest of the world also impact the tourism sector.

- **Quality of Infrastructure**: Tourism depends on the quality of infrastructure including roads, type of accommodation, number of camping sites, specific attractions in any given year, etc.

- **Marketing and Other Business factors**: Factors such as the amount of marketing, product quality, price and other business related factors affect tourism businesses as much as any other businesses.

Many of these factors also affect the number of visits at B.C.' s provincial parks. Overnight visits at BC Parks camping sites have dropped in the last two years from a peak of 2.965 million overnight visits in 1998 to 2.634 million in 2000. The average over the last 10 years has been 2.66 million visits.



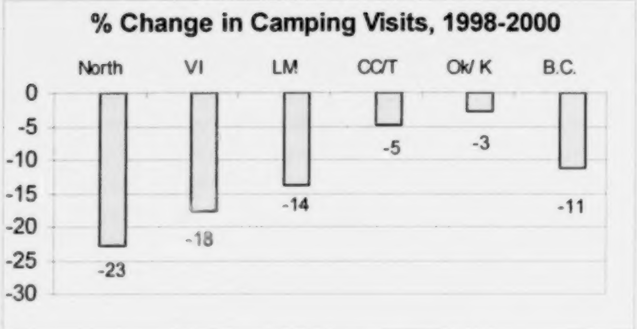
Source: BC Parks.

---

[38] The Tourism B.C. publication attributes 10,400 jobs to ecotourism, but this is based on an estimated 234,200 tourism related jobs. (Tourism BC, *Ecotourism Notes*, 2000)

[39] Price Waterhouse and The ARA Consulting Group Inc., *Tourism Industry Product Overview*, Council of Tourism Associations of B.C., 1996.

Since 1998, camping site visits at B.C.'s provincial parks have dropped in all B.C. regions with the most significant drop being in Northern B.C. (23% drop) and the least significant in the Okanagan/ Kootenays region (3% drop).



Note: The regions are: Northern B.C. (North), Vancouver Island (VI), Lower Mainland (LM), Cariboo Chilcotin/ Thompson (CC/T), Okanagan/ Kootenays (OK/K) and B.C.
Source: BC Parks.

3.4.2 Overview of the B.C. Outdoor Recreation Sector

The outdoor recreation sector is closely linked to the industry. The B.C. Outdoor Recreation Council is a council of federations that includes for example, outdoor clubs across B.C., associations that represent a specific activity such as the Snowmobiling Association and the Sea-Kayakers Association as well as specific interest groups such as the Alexander Mackenzie Trail Association. Approximately 120,000 individuals belong to clubs that are affiliated to the B.C. Outdoor Recreation Council.

In general, the outdoor recreation sector mainly consists of local residents taking part in day trips and activities whereas the tourism sector typically involves "people who travel to a place outside of his or her usual environment"[40]. From an economic impact perspective, there is a substantial overlap between tourism and outdoor recreation. The B.C. Ministry of Forests estimated that in 1993 about 25% of tourism expenditures are for outdoor recreation on Crown lands, while about 40% of outdoor recreation expenditures on Crown land are estimated to be from tourism.[41]

Table 22 Economic Impact of Tourism and Outdoor Recreation on B.C., 1993

Economic Impact	Tourism	Outdoor Recreation	Tourism and Outdoor Recreation*
Millions of 1993 $			
• Expenditures	$5,700	$3,910	$8,100
• Gross Domestic Product	$2,850	$1,955	$4,050
• % of Provincial GDP	3.7%	2.5%	5.3%
• Direct Employment	105,000	70,000	150,000

*Overnight outdoor recreation (tourism) is a component of both the Tourism and the Outdoor Recreation impacts, but is not double counted when the two are combined.
Source: BC Ministry of Forests, *1994 Forest, Range & Recreation Resource Analysis*

The table shows that tourism and recreation account for 5.3% of the provincial GDP and some 150,000 jobs. Direct employment related to tourism is estimated at 105,000 jobs, which includes tourism jobs related to outdoor recreation. Since tourism and outdoor recreation support a total of

---

[40] BC Stats, *Tourism Sector Monitor*, August/ December 2000.
[41] BC Ministry of Forests, *1994 Forest, Range & Recreation Resource Analysis*, Sec. 7.3.5, pg. 240

150,000 jobs, the portion of outdoor recreation employment that is not related to tourism is approximately 45,000 jobs.

About 60% of all recreation use on Crown land is estimated to occur in provincial forests outside of designated parks, while about 40% of use occurs in national, provincial and regional parks.[42] Wilderness recreation use (a recreational trip to a roadless, undeveloped natural area that can be reached only by trails, waterways or air) by both residents and non-residents of B.C., was estimated to be about 10% of total outdoor recreation use in the province (based on visitor-days spent).[43]

The economic benefits associated with outdoor recreation include the economic activity related to B.C. Parks. A recent study on the Economic Benefits of British Columbia's Provincial Parks estimates that the park system contributes $521 million to the provincial GDP, or approximately 0.5% of GDP. The study also estimates that BC Parks sustain some 9,100 direct and indirect PYs of employment every year.[44] The economic benefits of parks are widely distributed across B.C.'s communities and regions with over half of these benefits occurring outside the Lower Mainland and Victoria regions.

Most estimates of the economic value of outdoor recreation opportunities start with estimates of actual expenditures made in respect of these activities, and then add some measure of "consumer surplus" as well as some measure of "preservation value".[45] Consumer surplus occurs when the consumer (recreation participant) is willing to pay more for a recreation experience than it actually costs them. "Willingness to pay" surveys and travel cost data are generally used to estimate the magnitude of average consumer surplus involved in outdoor recreation activities. Preservation value occurs when residents feel their personal well being is improved when outdoor recreation and wilderness resources are protected, even when they do not participate in outdoor recreation activities. Reasons for the existence of non-use preservation values include:[46]

- Bequest motives: knowing the resource is protected for future generations.
- Existence motives: knowing the resource is protected for its own sake.
- Option motives: retaining the option to use the resource in the future.
- Altruistic motives: knowing the resource can be used by other people.

Consumer surplus and preservation values for B.C. residents in respect of outdoor recreation on Crown lands are estimated at about 35% of actual expenditures for general outdoor recreation, and 56% of actual expenditures for wilderness recreation.[47]

In general, recreation faces most of the same challenges and issues as the tourism sector. There are similar conflicts with other stakeholders and conflicting interests for example between non-motorized and motorized use (e.g. hiking and motor-cross or snowmobiling and backcountry skiing).

The next sections focus primarily on the economic impacts of SLUPs on the tourism sector, however some references are made to the recreation sector where applicable.

---

[42] Ibid, Sec. 7.3.4, pg. 238

[43] Ibid, Sec. 5.4.3, pg. 182

[44] British Columbia Ministry of Water, Land and Air Protection, *Economic Benefits of British Columbia Parks*, 2001.

[45] B.C. Ministry of Forests, *1994 Forest, Range & Recreation Resource Analysis*; also Coopers & Lybrand Consulting, *Economic Benefits of British Columbia Parks*, April, 1995 and Update: April 1996

[46] BC Ministry of Forests, *1994 Forest, Range & Recreation Resource Analysis*, Sec. 7.3.1, pg. 234

[47] Ibid, pg. 238

3.4.3 Base Case Assumptions

The tourism sector is a major component of economic activity in B.C. but only a small portion of tourism directly depends on crown land policies. Backcountry tourism accounts for between 4% and 9% of the tourism sector depending on the measure used. Also, approximately 25% of tourism expenditures are for outdoor recreation on crown lands.

It is very unlikely that the tourism sector in B.C. would have developed much differently without SLUPs over the past few years. The continuing slow growth of B.C. and Asian economies through the 1990s held back the growth in B.C. tourism in spite of robust growth in the U.S. and many parts of Canada.

It is much more difficult, however, to assess how the tourism sector might have developed in the longer term had there been no SLUPs. As noted earlier, while most tourism businesses are not directly related to crown land policies, most of them are at least somewhat reliant on preserving the image of "Super Natural" B.C. Moreover, BC Tourism reports that approximately half of all travelers to B.C. (residents and non-residents) believed that visiting a place that takes good care of the environment was "very important" to their trip decision.[48] The size of the tourism sector (approximately 110,000 part time and full time jobs, and 4.8% of the provincial GDP) makes even a small negative impact on the overall sector fairly significant.

As with other sectors, this study simply assumes the Base Case to be the situation that existed in 1991, prior to the implementation of the PAS and before SLUPs. As a result, this study attributes the full impacts of all land use zoning designations that resulted from SLUPs and the PAS to those two government initiatives. It also attributes any perceived changes in land use conflict, land use efficiencies, resource inventories, stakeholder communication, etc. to those two initiatives.

The next sections review the impacts of SLUPs on various indicators of tourism and recreation values.

3.4.4 Quantitative Data on Tourism/Recreation SLUP Impacts

The impacts of SLUPs on the tourism and recreation sectors are difficult to assess. Some of the factors making this difficult include:

- The many factors that affect tourism in addition to land use including the overall state of the North American and world economies, foreign exchange rates, the quality of our infrastructure, the incidence of high profile events, marketing effort, etc.
- Front country tourism is not directly linked to crown land policies. Incremental changes in crown land use and/or new park designations are likely to generate only subtle changes in front country activities that are extremely difficult to identify.
- Resource roads are rarely allowed through PAs, and SLUPs tend to encourage more

---

[48] Tourism B.C.: *Ecotourism Notes*, (unpublished).

environmentally sensitive road building practices in SMZs. This is likely a long-term benefit for backcountry tourism and recreation that primarily relies on pristine environments (e.g. wildlife viewing and some high-end guided packages), which might otherwise have suffered some degradation of the wilderness experience through more extensive roaded resource development. However, for activities such as touring/camping using vehicles, mountain biking, hunting and fishing, etc., the access provided by resource roads will increase visitation into many areas. Hence the impacts on tourism revenues of discouraging new construction of roaded access, as SLUPs tend to do, are offsetting in nature.

- B.C. Parks has not had the opportunity to undertake management plans for the new PAs, and thus there is uncertainty about just how much tourism activity will be allowed. Most PAs, especially the larger ones, have been established to protect fish and wildlife populations and generally do not allow significant commercial tourism developments (e.g., lodges). Therefore PAs can constrain growth in such activities. The negative impacts of these restrictions may be mitigated somewhat by using adjacent zones for lodge development and/or as "staging areas" for visitation into PAs.

Given these analytical challenges, producing reliable quantified impacts of SLUPs on tourism revenues and jobs is not feasible. However, an approximation of area statistics generated by Geographic Information System (GIS) map overlays serves as a proxy for the assessment of the impacts of SLUPs on tourism values. The Ministry of Small Business, Tourism and Culture (MSBTC), in cooperation with LUCO, has provided a breakdown of three available mapped tourism values overlain by the land use zone categories recommended by all the completed SLUPs in BC. These are:

- **Existing Tourism Use Areas**. These are key areas used by outdoor tourism operators for their businesses and their clients; uses range from wildlife viewing and guided hunting/fishing to heli-skiing and other forms of commercial back-country recreation.

- **Special Tourism Features/ Sites**. These include all biological, physical, cultural or historic feature of recreational/ tourism significance or value. These include:
  - Site-specific natural occurrences such as waterfalls, beaches and scenic viewing sites;
  - Activity use areas for climbing, diving, fishing, kayaking and other activities;
  - Infrastructure such as campgrounds, cabins/hut/shacks, boat ramps/docks, and airfield/aircraft landing sites;
  - Ministry of Forests proposed and existing Recreation Sites and picnic sites; and
  - Historic and other culturally significant sites.

  Regardless of the surrounding land use zone, the tourism feature sites are usually managed in a manner consistent with the approach for tourism use areas.

- **Accommodation Establishments/ Facilities**: These include hotels, motels, lodges, campgrounds, bed & breakfasts, guest ranches, cruise ships, float camps, charter boats and all other accommodation. The data cover 3,344 accommodation establishments of which 2,285 are based in SLUP areas.[49]

The following table summarizes the impacts of SLUPs on each of the three indicators.

Table 23 Distribution of Mapped Tourism Values by SLUP Zone Category

	Existing Tourism Use Areas (ha.)	**Special Tourism Features (#)**	**Accommodation Establishments (#)**
Total BC Inventory	**19,928,372**	**13,397**	**3,344**
Total Inventory in SLUP Areas (1)	**11,728,883**	**6,892**	**2,285**
Protected Areas:			
• % in Original Pas	13.9%	16.0%	2.5%
• % in New PAs (non-SLUPs)	3.9%	2.5%	0.2%
• % in New PAs (SLUPs)	6.6%	9.9%	1.0%
Sub-total Pas	24.4%	28.4%	3.7%
• Special Management Zones (SMZs)	26.4%	24%	10.3%
• No-logging/Wildland SMZs	1.1%	1.4%	0%
Sub-Total SMZs	27.5%	25.4%	10.3%
Sub-Total PAs and SMZs	51.9%	53.8%	14.0%
General, Enhanced and Other (2)	48.1%	46.2%	86.1%
Total % of Inventory in SLUP Areas	**100%**	**100%**	**100%**

Notes:

1. Includes only those areas where SLUPs have been completed.
2. Includes General Management Zones, Enhanced Management Zones and Settlement, private and agriculture zones.

Source: MSBTC and LUCO. Appendix 6 provides further detail.

Existing Tourism Use Areas:

SLUPs seem to have targeted regions that have high existing tourism use for protection under PAs and for special designation under SMZs:

- The new PAs (SLUPs and non-SLUPs) protect 10.5% of Existing Tourism Use Areas. This brings the total hectares of existing tourism use areas that are now protected to 24.4%, about twice as much as the percentage of the overall land base that is now protected.

- In addition, 27.5% are in SMZs, bringing to 52% the percentage of existing tourism use areas that benefit from a special designation. To the extent that the SMZ designations protect natural values important to tourism, they should be an improvement over the Base Case.

- Approximately 48% of the Existing Tourism Use Areas remain in general and enhanced zones. For those regions, it is assumed that extractive resource development activities would be managed in a manner similar to the Base Case, e.g., under the Forest Practices Code (FPC) and

---

[49] Tourism BC reports that there are 1,867 accommodation establishments operating in B.C. or 11% of all tourism establishments in B.C. (Tourism BC, *The Value of Tourism*, 2001). These include hotels, motels, tourist courts, lodging houses, campgrounds and trailer parks, but they exclude recreation camps, vacation camps, cruise ships, charter boats, etc. Appendix 6 includes more detail on what types of establishments are included in the 3,344 estimate of establishments used for assessing the impacts of SLUPs on tourism and recreation values.

Mineral Exploration Code (MEC). As a result, they may be more at risk of some future degradation from logging, oil and gas, mining and their associated roaded developments.

Number of Special Features:

The Special Features are defined to include site-specific natural occurrences such as waterfalls, etc. While such special features are often managed on a site-specific basis without SLUPs, it seems reasonable that the overall associated natural experience is more likely to be preserved under PAs and SMZs. These Special Features are also assumed to be at a higher risk of disturbance in the remaining zones.

The results regarding Special Features are similar to Existing Tourism Use Areas in that approximately half of the Tourism Features are located in PAs and SMZs, again implying that SLUPs have successfully targeted tourism features for protection. By comparison, 29% of B.C.'s land base is in PAs or SMZs (excluding 1.9 million hectares in the Okanagan LRMP, or 2% of the B.C. land base that is subject to special management rules but is not classified into SMZ and General Zones).

The results also show that 46% of special features continue to be based in General, Enhanced, and Settlement /Private /Agriculture zones and are likely to be managed in a manner similar to what would have occurred under the Base Case (without SLUPs but with FPC, MEC, etc.).

Accommodation Properties:

The table shows the following:

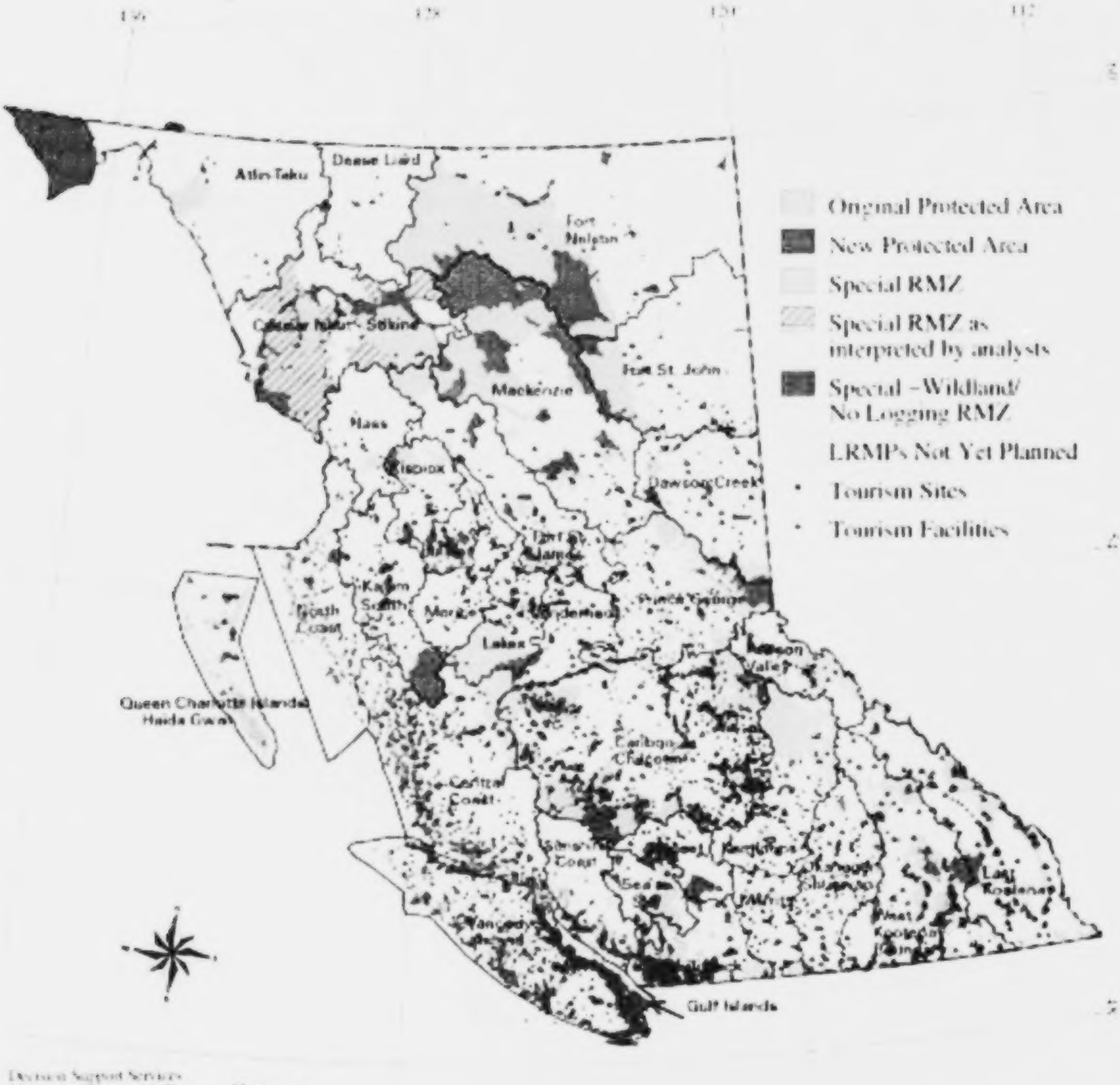
- 59% of accommodation properties are located in Settlement/ Private/ Agriculture Zones, which are virtually always located around existing communities. As a result, SLUPs would have virtually no impact on these operations, as their economic viability is driven much more by other factors.

- Another 27% of properties are located in General and Enhanced Zones, where it is assumed that extractive resource development activities would be managed in a manner similar to the Base Case.

- A little over 10% of establishments are in Special Management Zones, where presumably nature-based tourism values would be taken more into account in the planning of extractive resource activities.

- The number of properties affected by new PAs is inconsequential at 1% of the total.

The following map shows tourism sites and facilities for B.C. by type of zone.


Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special - Wildland/ No Logging RMZ
LRMPs Not Yet Planned
Tourism Sites
Tourism Facilities
Atlin-Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Fort St. John
Mackenzie
Nass
Kispiox
Dawson Creek
Kalum South
North Coast
Morice
Lakes
Prince George
Robson Valley
Queen Charlotte Islands/ Haida Gwaii
Cariboo Chilcotin
Central Coast
Sunshine Coast
Kamloops
Okanagan Shuswap
Kootenay
West Kootenay Boundary
Vancouver Island
Gulf Islands

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic Datum: NAD83

Tourism Sites and Facilities
January 2001

3.4.5 Impact Assessment of SLUPs on Key Indicators

This section summarizes the economic impacts of SLUPs on the tourism sector and on recreation opportunities. The analysis is based on a review of the quantitative data and thirteen interviews with tourism industry and recreation sector representatives. These included:

- Four interviews with representatives from the Tourism Action Society in the Kootenay, the Cariboo-Chilcotin Tourism Association, the B.C. Guide Outfitters Association and the Council of Tourism Associations;
- Six interviews with backcountry tourism operators covering a variety of sub-sectors including heli-fishing (one operator), heli-skiing (one major operator), guide outfitting (two operators) and two lodge operators. Together, these operations generate 500 Full-Time-Equivalents (FTEs) of employment;
- One interview with the B.C. Outdoor Recreation Council;
- One interview with a BC Parks representative; and
- One interview with a representative from the B.C. Ministry of Small Business and Tourism.

Eight of ten tourism industry representatives have been directly involved in the development of SLUPs, typically as members of the various tables. The B.C. Outdoor Recreation Council has also taken an active role in the development of SLUPs. The interviews in the tourism and recreation sectors provide a broad provincial coverage.

The following table summarizes the results of our analysis. More detail is provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Tourism Sector***
Would the tourism sector have developed differently without SLUPs	Twelve interviewees in the tourism and recreation sector commented on whether their sector would have developed differently without SLUPs: • Five believe that SLUPs have led to more growth in tourism. SLUPs helped contain the level of conflict and in doing so, helped foster the growth of backcountry tourism. • Five believe that SLUPs have had no impact on the development of the tourism sector. • Two believe that SLUPs have hindered the growth of the tourism sector. One operator is in the Central Coast and the other is in the Kootenays. One interviewee suggested that had the Stein Valley been part of a broader SLUP, commercial tourism might have been allowed to proceed and the Lillooet region might have been developed in a more balanced manner. Instead the Stein Valley was protected and the conflicts over land use in the rest of the Lillooet region have simply shutdown all activities.
Impact of new PAs and SMZs on protection of tourism and recreation values	The quantitative analysis shows that SLUPs and new PAs have improved management for land-based backcountry tourism and recreation values (e.g. viewscapes and fish and wildlife populations), most notably for the 10.5% of Existing Use Areas and 12.4% of special features in new parks. The extent to which this will translate into tourism growth will depend on whether the yet-to-be determined park management plans will support new commercial activities (the new PAs tend to grandparent existing backcountry operators).

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on the Tourism Sector***
	Although SLUPs and the PAS have improved management for land-based backcountry tourism, backcountry tourism comprises less than 10% of the total tourism revenues in BC and the overall impact of SLUPs on the BC tourism industry is likely minor, at least in the short-term. In the longer term, the positive impacts of SLUPs on the overall tourism and recreation sector may be more significant if SMZs are managed with that sector as a key emphasis and as wilderness in other parts of the world is compromised by population growth and resource development. As noted earlier, approximately 25% of tourism expenditures in B.C. are linked to outdoor recreation and these may ultimately benefit from SMZs and the PAs.
Impacts of new parks on tourism visitation	Eleven out of 13 interviewees believe that SLUPs have not resulted in increased visitation to their region or to B.C. Some believe that it will in the longer term. Others believe that new parks generate very little tourism traffic because of B.C. Parks' conservation bias. As one interviewee said, "one cannot build an economy around cabins". Between 1998 and 2000, camping visits at B.C.'s provincial parks dropped by 11%.
Impacts on commercial recreation tenures	Ten out of 13 interviewees believe that SLUPs have not resulted in new operators applying for commercial tenures. There are some 235 active guide-outfitting tenures in B.C. and most are family owned operations that have been in place for over 35 years. While there has been an increase in guide-outfitting tenures, this is more a result of other government policies than SLUPs. Approximately half of the interviewees believe that SLUPs may increase the dollar value of existing commercial tenures (although under the current tenure system, the tenures themselves do not have an exchange market value and the Crown is the only beneficiary of increases in the potential of a tenure, and only when the tenure expires and is replaced). While SLUPs removed some uncertainty regarding recreation tenures, other factors play a large role in determining the value of the tenures, and even if tenures had an exchange market value, it would be difficult to observe the impacts of SLUPs.
General implications of restrictions on the development of commercial structures or infrastructure in PAs	Eight out of twelve interviewees believe that restrictions in PAs have hindered tourism development while the others believe restrictions have had very limited impact. While existing tenures have been grand-parented, restrictions on new tenures will likely restrict new development. Objectives for recreation (including motorized activities) have allowed the various sub-groups within the tourism sector to share the resource. Some of the industry representatives believe that BC Parks has an anti-tourism attitude and that their policies are sometimes unclear regarding tourism development.
Impacts of New PAs and SMZs on tourism investment	Nine tourism sector respondents commented on the impacts of SLUPs on tourism investment. Of these, 2 believe that SLUPs had a positive impact, 3 believe that SLUPs had no impact and 4 believe that SLUPs had negative impacts on tourism sector investment. Two noted positive impacts on the eco-tourism sector and the reduced conflicts between the tourism sector and the forest industry as a factor leading to more investor confidence.

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on the* ***Tourism Sector***
	Some of the reasons why SLUPs have not translated to more investment in the tourism sector include: • SLUPs are very high level plans and as a result, they don't really address tourism issues such as VQOs and viewscapes; • Parks do not always translate into more tourism visitation; and • SLUPs are very recent and the positive impacts on investment have yet to occur. Four interviewees believe that SLUPs have decreased tourism investment. The lack of consensus in some regions, and the expectation that SLUPs will lead to consensus, has paralysed development in regions where SLUPs have not yet been completed. Also, an interviewee in the Kootenay region complained that SLUPs have made the approval process more complex thereby worsening the investment climate.
Impact on costs	Seven of the ten industry contacts chose to comment. All believe that SLUPs have had no impact on costs other than the costs of planning and attending meetings relating to SLUPs.
Impact on resource inventories developed by governments	Ten out of twelve interviewees who chose to comment on this issue believe that SLUPs have led to better resource inventories in the tourism sector. The other two believe that SLUPs have not had an impact on resource inventories developed by governments, mainly because the plans provide direction to develop inventories but this has yet to happen in some of the regions.
Impact on level of land use certainty	The majority of interviewees in the tourism and recreation sectors believe that SLUPs had a positive impact on land use certainty (8 believe the impact was positive, 5 that it was neutral and 2 believe that the impact was negative). SLUPs did not increase land use certainty as much as was initially expected because the plans are too high level to address tourism related land use issues such as VQOs and viewscapes.
Impact on local/provincial conflict	The extent to which SLUPs have helped reduce conflict between tourism, recreation, and other stakeholders depends on the region. In most regions, SLUPs have helped reduce conflict between the forest industry and the tourism sector (five out of 10 tourism industry interviewees said SLUPs have reduced conflict). Those who said that SLUPs did not help reduce conflict with the forest industry believe that SLUPs are not that helpful because the plans are regional in nature, whereas most conflicts are very localized. The regional nature of SLUPs has also limited SLUPs' ability to reduce conflict between sub-groups within the tourism sector, for example, snowmobiling and heli-skiing. The same applies to conflict between the recreation and tourism sector. A few interviewees mentioned the benefits associated with the Commercial Recreation Policy and other initiatives that have helped reduce some of those local conflicts. The two interviewees who believe that SLUPs led to greater conflict between stakeholders are based in the Kootenays and the Central Coast. As one interviewee pointed out, the foundation of the conflicts existed prior to SLUPs but the land use process heightened differences. SLUPs have not helped resolve conflict between First Nations and tourism/ recreation, primarily because First Nations did not play an active role in SLUPs.

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on the* **Tourism Sector**
Impacts on communication with government agencies, stakeholders and First Nations	Ten out of 13 interviewees in the tourism and recreation sectors believe that SLUPs have improved communication between their sector and government agencies. Another interviewee believes that communication with government agencies remained the same. Virtually all interviewees in tourism and recreation also believe that communication with stakeholders has also improved, particularly with the forest sector. In most regions, SLUPs have not affected communication with First Nations because they were not actively involved in the process. One interviewee mentioned how SLUPs are improving communication between First Nations and the tourism sector in the Central Coast, particularly when compared to the lack of involvement and communication with First Nations during the development of the Vancouver Island Land Use Plan. One of the very few negative comments was from the Kootenay region where one interviewee believes that SLUPs have produced more talk than communication. The lack of government resources assigned to tourism and recreation is viewed as a main reason for the lack of efficiency relating to land use management in those sectors. At least five interviewees mentioned that BC Parks had not received more resources yet were handling all the new parks. The MSBTC is viewed as a very poor cousin to MELP and MOF.
Implications of differences between B.C. land use plans and those of other jurisdictions	Four interviewees chose to comment on whether B.C.'s land use process results in greater investor confidence in the tourism sector than in other jurisdictions. They all believe that the land use process in B.C. and the commercial recreation policy have been positive to the backcountry sector. They view B.C. as being at least ten years ahead of other provinces in terms of land use planning, with some of the other jurisdictions investigating B.C. with the intent of copying it.

In summary, SLUPs have had little immediate impact on the tourism sector and on recreation, except in certain regions where SLUPs have helped reduce conflict with the forest sector. It is very difficult to speculate what might be the long term impacts of SLUPs on the tourism sector and on recreation. It is even difficult to speculate whether these impacts will be positive or negative. Since tourism and recreation cover such a broad spectrum of activities, the impacts are not and will not be uniform across the sector.

The quantitative analysis shows that PAs and SMZs have successfully targeted tourism features and tourism and recreation use areas for protection. The data also show that some 10% of establishments are in SMZs, where nature-based tourism values would presumably be taken more into account when planning resource development.

To the extent that provincial parks play an important role in providing outdoor recreational opportunities for the enjoyment of both British Columbians and visitors, however, more economic activity related to the parks might be expected in the long term. The park system contributes about $521 million to the provincial GDP and sustains about 9,100 direct and indirect PYs of employment every year. Research shows that park visitors derive significant benefits from the recreation activities beyond the value of market-based transactions. As well, the economic value of ecological services provided by protected areas is significant. These non-market economic benefits, although significant and potentially larger than market-based valuations were not quantified in this study.

3.5 Agriculture and Other Primary Industries

This study focuses on the main primary sectors impacted by SLUPs, namely the forest industry, mining, oil and gas and the tourism/ recreation sector. SLUPs may have also impacted on other primary industries in B.C. including the agriculture sector (and in particular range lands and grazing); hydro operations; hunting, trapping and fishing; and botanical forest products.

It was outside the scope of this study to conduct detailed analyses of the impacts of SLUPs on those sectors. However, for the agriculture sector, LUCO provided some information on the SLUP impacts on the Agricultural Land Reserves (ALR) and two interviews from industry representatives provided insight into the SLUP impacts on grazing activities.

This section briefly summarizes the results of this overview.

3.5.1 SLUP Impacts on Agriculture

The agriculture sector in B.C. and related manufacturing accounts for $2 billion dollars or approximately 2% of the total GDP of the province (BC Stats, 1998).

This section provides an overview of the impacts of SLUPs and the PAS on the Agriculture Land Reserve (ALR) and the SLUP impacts on range resources.

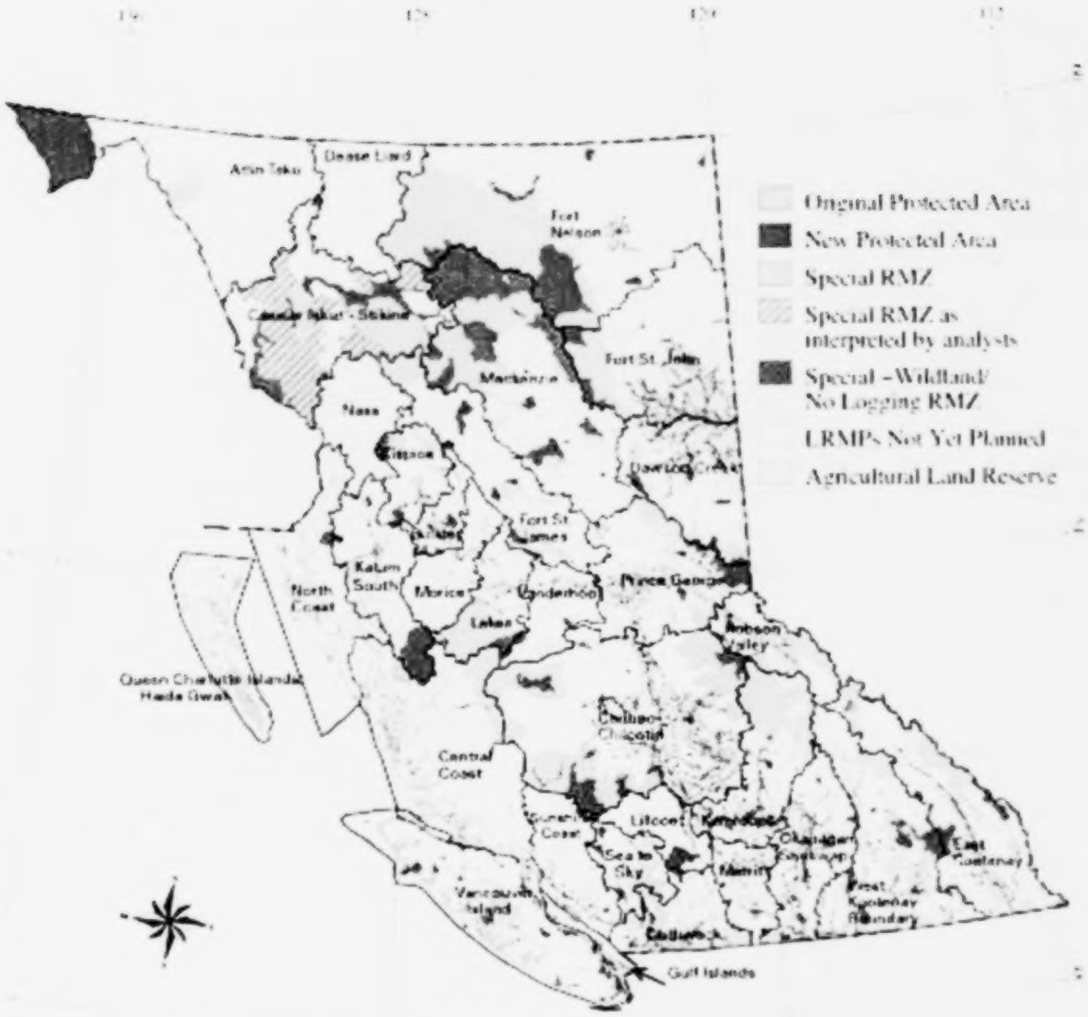
SLUP Impacts on ALR

The B.C. Agricultural Land Reserve (ALR) covers some 4.6 million hectares or 4.8% of the total area of the province. Crop production primarily occurs on private lands and is therefore not subject to SLUPs.

As part of this project, LUCO provided data on the hectares of ALR by type of zone. The data show the following:

- 1.7% of the ALR is in Protected Areas (PAs) including 1.5% in new SLUP protected areas and 0.2% in original protected areas.
- 6.4% of the ALR is in SMZs.
- 34% of the ALR is on private lands and/or in settlement areas.
- 10% is in areas that have not yet been planned.
- The balance or 48% is in general, enhanced or unplanned areas.

The following map and table show the ALR by type of zone as of January 2001.


Atlin Taku
Dease Liard
Fort Nelson
Cassiar Iskut - Stikine
Fort St. John
Mackenzie
Nass
Kispiox
Dawson Creek
Fort St. James
Kalum South
North Coast
Morice
Vanderhoof
Prince George
Lakes
Robson Valley
Queen Charlotte Islands/ Haida Gwaii
Cariboo-Chilcotin
Central Coast
Sunshine Coast
Lillooet
Kamloops
Okanagan Shuswap
Sea to Sky
Merritt
Vancouver Island
Chilliwack
West Kootenay Boundary
East Kootenay
Gulf Islands
Original Protected Area
New Protected Area
Special RMZ
Special RMZ as interpreted by analysts
Special – Wildland/ No Logging RMZ
LRMPs Not Yet Planned
Agricultural Land Reserve

Decision Support Services
Ministry of Sustainable Resource Management
Projection: Albers Equal Area Conic, Datum: NAD83

Agricultural Land Reserve
January 2001

Prepared by:
Pierce Lefebvre Consulting

With assistance from:
Stuart Gale & Associates Ltd.
and BriMar Consultants

Table 24 SLUP Impacts on Agricultural Land Reserve

AREA is reported in millions of hectares	Provincial Area		Agricultural Land Reserve		ALR as a % of B.C.
	Hectares	%	Hectares	%	
Protected Areas:					
• New SLUP Protected (Includes Lower Mainland PAs)	4.8	5.1%	0.07	1.5%	1.4%
• New Non-SLUP Protected (excludes Lower Mainland PAs)	1.7	1.8%	0.00	0.0%	0.0%
• Original Protected	5.3	5.6%	0.01	0.2%	0.2%
Total Protected Areas	11.9	12.5%	0.08	1.7%	0.7%
SMZs	15.5	16.4%	0.29	6.4%	1.9%
Agriculture/Settlement/Private	3.2	3.4%	1.55	34.0%	48.1%
Enhanced	15.1	15.9%	1.12	24.5%	7.4%
General	23.0	24.3%	1.01	22.1%	4.4%
Unclassified	1.9	2.0%	0.04	1.0%	2.3%
Not Yet Planned	24.1	25.4%	0.47	10.4%	2.0%
Provincial Total	94.7	100.0%	4.56	100.0%	4.8%

Source: Land Use Coordination Office, January 2001.

Impacts on Range Resource

The Ministry of Forests reports forage production for 1997/1998 at approximately 1 million Animal Unit Months (AUMs) for crown lands.[50] This represents approximately 60% of the total forage requirements in the province each year with the remaining 40% being produced on about 1.5 million hectares of private rangelands. Approximately 8.3 million hectares of crown land is being used for grazing by the ranching industry and guide outfitters (most of which is not ALR land).[51] The major regions for grazing are the Cariboo region (35% of all AUMs generated on crown lands in 1997/1998), the Kamloops region (37% of crown land AUMs) and the Prince George region (16% of crown land AUMs). The remaining 12% of AUMs in the province are in the Nelson and Prince Rupert Forest Regions with very few AUMs in the Vancouver Forest Region.

Two interviews were conducted with beef cattle industry representatives including the B.C. Cattlemen's Association and a rancher with direct involvement in SLUPs. Also, some of the agency representatives who are broadly involved in the land use process provided some general comments on the impacts of SLUPs on the agriculture sector.

Based on those interviews, SLUPs have affected the beef cattle industry as follows:

- Cattle grazing has been grand-fathered in parks but expansion plans may be somewhat compromised.
- SLUPs have led to some increases in operating costs (one interviewee guessed an increase of between 1% and 5%). Some of the increase may be due to constraints that would be imposed by the Forest Practices Code.

---

[50] AUM or animal unit month is the amount of forage required for one month by an average weight beef cow, age six months or older. Source: 1997/1998 Ministry of Forests Annual Report.

[51] Source: Ministry of Forests, *1994 Forest, Range & Recreation Resource Analysis*, 1995.

- SLUPs have recognized, and in some cases raised awareness of, agricultural concerns such as noxious weeds.

- SLUPs have also provided access to the Grazing Enhancement Fund (GEF), which was conceived to mitigate the impacts of SLUPs.

The individuals contacted as part of the agriculture sectors also commented on general issues such as the SLUP impacts on land use certainty, communication and conflicts between stakeholders and other indicators. However, with only two interviewees in this sector, the results were combined with those in the community area.

3.5.2 SLUP Impacts on Other Primary Sectors

It was outside the scope of this study to conduct detailed analyses of the impacts of SLUPs on other primary industries including hydro operations; botanical forest products; hunting, trapping and fishing. However, a review of the SEAs allow us to make the following comments:

Hydro-Electric Power Generation

Existing BC Hydro operations will not be affected by SLUPs but some of BC Hydro's proposed expansion projects may be somewhat affected:

- The SEAs for the Dawson Creek and Fort St. John LRMPs mention that it is possible that the Peace River-Boudreau Lake Protected Area could preclude the Site C project since government policy does not normally allow hydro dams in PAs. The SEA stresses, however, that the plan does not recommend that the Peace River-Boudreau Lake PA preclude the Site C project.[52]

- The SEA for the Fort Nelson LRMP suggests that the key implication is from the proposed Grayling-Liard PA that "would preclude BC Hydro' s previously proposed (but now dormant) 4318-megawatt Liard hydro-electric project, a large development by Hydro standards. However, according to BC Lands, the flood reserve has been lifted implying that Hydro no longer has the property rights for this opportunity."[53]

- The SEA for the Cassiar-Stikine LRMP indicates that the plan may preclude small hydro developments on parts of various rivers in the plan area and there may be constraints on crossings for future power transmission lines.

- The SEA for the Robson Valley LRMP mentions that the proposed PAs may preclude 1 out of 14 very good smaller hydro sites and 4 out of 100 viable sites from developing.

Botanical Forest Products

The botanical forest products industry is typically not mentioned in the SEAs for the land use plans.

---

[52] Source: Ministry of Employment and Investment et al., *Dawson Creek LRMP, Socio-Economic Environmental Assessment*, 1999; also, *Fort St. John LRMP*.

[53] Source: Ministry of Employment and Investment et al., *Fort Nelson LRMP Socio-Economic & Environmental Assessment of Recommended LRMP*, 1997.

The SEA for the Mackenzie LRMP does discuss botanical forest products, but only provides a qualitative assessment of the situation:

> "The implications of the recommended Plan for botanical forest products are difficult to assess, given the lack of information on these values, their low commercial significance at this time, and the varying effects of forest practices. The Plan states that opportunities for the sustainable use of botanical forest products should be maintained, and even more specifically, that identified sites for botanical forest products will be considered at landscape and operational planning levels, an improvement over the Base Case."[54]

Hunting, Fishing and Trapping

The SEAs typically provide a qualitative assessment of SLUP impacts on hunting, fishing and trapping values. The SEA of the Recommended Robson Valley Land Use Plan, for example, recognizes that current/ Base Case management strategies would lead to a decline in hunting, fishing and trapping values and that an improvement in management strategies might help prevent part of the decline in wildlife populations available for trapping and hunting.

---

[54] **Source**: Holman, Gary et al., *Mackenzie LRMP Socio-Economic & Environmental Assessment of the "Mackenzie Draft Recommended LRMP"*, 2000.

4. Impact Assessment: Non-Industrial Interests

4.1 Environmental Outcomes

It is beyond the scope of this study to provide an overall assessment of SLUP impacts on environmental values, however, in order to add context to the socio-economic assessment, this section provides an overview of environmental issues in B.C. and some of the impacts of SLUPs on environmental values.

In September 2001, Liz Williams and Andy MacKinnon from the Ministry of Sustainable Resource Management (MSRM) prepared much of Sections 4.1.1 through 4.1.4 at the request of the consulting team, the Study Steering Committee and the MSRM. Because these sections were prepared at a different time and with slightly different databases than the rest of the report, there are small differences in reporting the percentage of the B.C. land base by type of zone. The differences are not consequential and do not impact the general study findings.

Also to help set the context for the socio-economic assessment, the consultants carried out interviews with six environmental sector representatives on the impacts of SLUPs on various indicators such as the frequency and intensity of land use conflicts in B.C., the level of land use certainty and public awareness of environmental issues. Sub-section 4.1.5 presents the results of these interviews.

4.1.1 Overview of Environmental Issues in B.C

Valuing the Environment

It is not possible to consider the environment as 'a sector' in the same sense that industrial and government sectors are considered in this report. Ecosystems and their services have a primary value that cannot be measured since no life would exist without them. A healthy environment provides the ecological services (such as clean water, air and soil) upon which all life depends and which support all human industrial, economic, recreational, settlement and other uses.

Although it is impossible to put an absolute value on nature, it is possible to begin to estimate the values of small losses or additions to the existing flow of ecosystem services. Environmental economists have recently estimated that the value of the world's ecosystems in terms of their services in support of human well-being to be 1.8 times the value of the world's total market production of goods and services (R. Constanza et. al. *Nature*, Vol. 387, 15 May 1997, pp. 253 - 260). Using an independent methodology economists have estimated the ratio of New Zealand's land-based ecological services to marketed goods and services to be 52%, excluding consideration of the marine environment. Although these estimates are extremely rough they do begin to suggest the scale of the importance of the environment to human well-being.

The environment provides the direct economic basis for sectors such as forestry, fisheries, agriculture, mineral and energy production, recreation, and tourism. In addition, sound environmental management appears to be increasingly important in marketing goods and services produced in B.C. to international markets. Eco-certification initiatives for forestry and tourism rely tc some degree on the perceptions and the realities of the broader backdrop of environmental management practices in the province. As international scrutiny of the environmental impacts of other industries such as mining, energy production and agriculture intensifies, these too may benefit from a broad backdrop of sound environmental management.

More work is called for in linking environmental services to British Columbia's well-being, whether measured by market accounts or by other means. It is widely recognized that avoiding environmental damage and managing in a sustainable manner is, by orders of magnitude, far more cost effective than restoration and repair. Short and long term costs of damage to the environment can affect a host of industrial and economic concerns ranging from lost fisheries opportunities, lost forestry opportunities, loss of water quality, lost environmental options, loss of tourism opportunities, etc. It should be noted that over the last seven years the province has put a high priority on terrestrial and watershed restoration projects, funded through Forest Renewal BC. Total spending between 1994 and 2001 (not including the current fiscal year) for the Watershed Restoration program was approximately $400 million. The Terrestrial Ecosystem Restoration program spent nearly half a million dollars in 2000, and has a 2001 budget of over $2 million. These expenditures account for a fraction of the restoration initiatives proposed, which are necessarily limited by funding.

SLUPs provide the context for a scientifically-based, principled approach to environmental management that strives for sustainability, accountability, and responsibility. The SLUP program was initiated in order to resolve and manage resource use conflicts, and achieve a balance of social, economic and environmental interests.

Environmental Trends

One of the key reasons for carrying out land use planning, is to help manage wildlife, habitat, and other environmental values on Crown land in a sustainable manner.

The report, Environmental Trends in BC 2000, shows that 75 species of vertebrates and 241 vascular plants are currently listed as either threatened, endangered or candidates for these designations. In addition, 420 vertebrate and vascular plant species are listed as vulnerable. Since 1996, six bird species have been added to the list. Of forest species, 8% of 1,079 known forest-dwelling vertebrate and vascular plant species are threatened, endangered or candidates for these designations, and the number of species that are threatened has increased by 2% between 1997 and 1999. Agriculture, urban development and logging are listed (in that order) as the most important threats to threatened and endangered (Red-listed) vertebrate species. (Sources of information for species at risk come from the BC Conservation Data Centre, using an internationally recognized system of ranking species).

Regarding historic wildlife range, 44% of 36 forest-dwelling mammals with known range trends have contracting ranges, a trend that may indicate that a species is moving towards endangerment. A number of managed wildlife species such as Caribou, Columbian Sharp-tailed Grouse and Grizzly bear no longer occupy significant portions of their historic ranges. Mule/Black-tailed deer are declining in 31% of their historic range. Moose are stable in most (77%) of their historic range but declining in the interior of the province.

Of the known 5,476 salmonid stocks, 3% are now extinct, 13% are at moderate to high risk of extinction, and 4% are of special concern. Important factors contributing to extinct and declining stocks include loss of habitat due to logging, and power and urban development.

At least 12% of the forestland area in the province is riparian. Since implementation of the Forest Practices Code in 1995, logging of riparian areas beside medium to large streams has been significantly reduced. However, widespread retention of streamside vegetation beside smaller streams less than 1.5 metres wide has not occurred. Most (87%) logging in riparian areas has been by clearcutting; 13% has been by selective logging. Logging and agriculture are listed as the most important threats to threatened or endangered riparian-user vertebrate species.

Strategic Land Use Planning provides an opportunity to establish management direction that will ameliorate deterioration trends in key environmental indicators. These trends emphasize the need for land and resource management to continue to look for ways to manage environmental values for sustainability.

4.1.2 SLUP Products That Affect Environmental Values

There are inherent difficulties in developing a full assessment of the effects of SLUPs on environmental values, and conclusions cannot be drawn directly from monitoring results at this time (see section 4.1.4 following). Without significantly increased support for environmental monitoring programs, this will remain true for the future in many areas. The following summaries are drawn from existing reports and communication from a number of agencies with interests in land use planning, and are based on a wide variety of means and methods of assessing both environmental outcomes and implementation of land use plans.

The section reviews four main SLUP products that affect environmental values:

- Protected areas
- Other legal designations
- SMZs (biodiversity, fish, wildlife and water)
- Management directions that differ from standard practices

A. Protected Areas

With a few exceptions, SLUPs have been the key delivery mechanism for new protected areas in British Columbia, the large majority of which have been consensus agreements by planning tables. It is reasonable to assume that where land use planning decisions have resulted in legislated changes to land use that clearly provide protection of environmental values, long term benefits to those values and the likelihood of sustaining them are more certain. Protection of representative ecosystems through establishment of protected areas can be considered a key indicator of the benefits to environmental values.

Key goals of the Protected Areas Strategy (PAS) are:

1) To protect viable, representative examples of the natural diversity of the province, representative of the major terrestrial, marine and freshwater ecosystems, the characteristic habitats, hydrology and landforms, and the characteristic backcountry recreational and cultural heritage values of each ecosection, and

2) To protect the special natural, cultural heritage and recreational features of the province, including endangered species and critical habitats, outstanding or unique botanical, zoological, geological and paleontological features, outstanding or fragile cultural heritage features, and outstanding recreational features such as trails.

PAS recognized the need for flexibility in the application of 12% as a target for protection. It was recognized that more than 12% would be required in some areas in order to protect large, dynamic ecosystems such as predator-prey systems and large wilderness areas, and that 12% protection of some ecosystems would not be feasible in areas which have been heavily modified by humans.

Between 1993 and April 2001, 6.5 million hectares have been protected, creating a total of 12,273,558 ha or 12.95% provincially (not including areas identified in the Central Coast and Lillooet LRMPs).[55] Although more than 50% of terrestrial ecosections remain under represented (less than 12% protected), improvement in representation since 1991 is likely to reduce risk to those ecosystems, bearing in mind that degree of fragmentation of protected areas (or lack of connectivity) and its impact on species and ecosystem viability has not been assessed. (See Appendix 11, Protected Areas in BC by Ecosection, 1999. It should be noted that total protected area has increased by 1.5% since these figures were tabulated).

Table 25 Protection of Terrestrial Ecosystems

	Ecosections	
% Protected	1991	2001
>12%	16%	38.7%
6-12%	12%	19.8%
1-6%	19%	29.25%
<1%	53%	12.26%
Total	100%	100%

Source: Ministry of Sustainable Resource Management based on LUCO data.

B. Other Legal Designations

A number of other legal designations that arise from SLUPs can reasonably be assumed to benefit environmental values. These include Wildlife Management Areas, No-Harvesting Areas, Harvesting Deferral Areas (pending further research), Sensitive Areas, and special legal designations.

- **Wildlife Management Areas**: Wildlife Management Areas established under the Wildlife Act allow continued industrial development, do not affect tenures or permits granted prior to WMA designation, and give a priority to conservation and management of wildlife values. In this respect, WMAs are considered to provide sustainable management of wildlife resources. Since 1993, seven WMAs have been recommended and established through SLUPs, covering 208,338 hectares, or 90% of the total WMA area provincially.

Table 26 Wildlife Management Areas Recommended Through SLUPs

---

[55] As noted earlier, MSRM staff contributed much of this section in September 2001 at a different time and with different databases than the rest of the report. As a result, there are differences in the reporting of the B.C. land base by type of zone, but these differences are not consequential to the study findings. For example, while this section mentions that 12.95% has been protected, the rest of the report is based on earlier data that shows that 12.5% of B.C. had been protected. At the time of publishing this report, (October 2001), PAs accounted for 13.14% of the B.C. landbase. (Footnote by *Pierce Lefebvre Consulting*)

Wildlife Management Area	Area (ha)	Primary Species	Primary Habitat	When Designated	SLUP
Columbia Wetlands	26,200	waterfowl	wetlands	Apr-96	East Kootenay Land Use Plan
Tofino Mudflats	1,650	waterfowl, shorebirds	intertidal & some upland	Apr-97	Vancouver Is. Land Use Plan
East Side Columbia Lake	7,220	waterfowl, ungulate winter range	wetlands, lakeshore and upland habitat	Sep-97	East Kootenay Land Use Plan
Midge Creek	14,757	buffer to West Arm Park; various species; woodland caribou reintroduction	various; old growth forests in valley bottoms, high elevation wetlands, riparian	Apr-98	West Kootenay-Boundary Land Use Plan
Hamling Lakes	30,572	buffer to Goat Range Park; various species, mountain caribou	various; old growth forests in valley bottom, high elevation lakes, riparian	Apr-98	West Kootenay-Boundary Land Use Plan
Sturgeon Bank	5,152	waterfowl/ shorebirds	intertidal/subtidal foreshore	Oct-98	PAS process endorsement
Todagin	122,787	Stone's Sheep; various other wildlife	various, includes Todagin Plateau and Tsatia Mountain	March-01	Cassiar Iskut-Stikine LRMP
Total	208, 338				

Source: Wildlife Branch, Ministry of Water, Land and Air Protection

- **No Harvesting Areas and Harvesting Deferrals**: Two LRMPs recommended some no harvesting zones and a number of LRMPs have recommended areas where timber harvesting is deferred.

  The Bulkley LRMP recommended no timber harvesting in SMZs '1' except where required for mineral and energy exploration or development, and no harvesting in core ecosystems throughout the TSA, except where required for mineral and energy exploration or development, or if required for forest health and integrity. A Higher Level Plan legalizes this direction, assuring benefits to environmental values.

  The Cassiar Iskut Stikine LRMP recommended no harvesting in several SMZs to maintain environmental values, and recommended a 15-year deferral period except where harvesting is required for mineral and energy exploration or development. There is no Higher Level Plan for this LRMP as yet, and although development is not imminent, there is no legal basis in place to disapprove proposed forest development plans. In this respect, there is less assurance that this SLUP will continue to benefit environmental values.

  Similarly, Fort St James, Prince George and Robson Valley LRMPs have provisions that limit or defer timber harvesting for up to 10 years to maintain caribou populations, but until these provisions are legalized there is no assurance of maintaining caribou values.

  While the Mackenzie LRMP has a considerable amount of special management area (Wildland zone) that prohibits timber harvesting, there is no legal mechanism at this time to prevent harvesting. Also, direction for the rest of the plan area falls below provincial policy, in that resource management zones will be used as the basis for landscape unit planning. This will override provincial policy that requires that no more than 50% of any biogeoclimatic ecosystem classification zone falls under low biodiversity emphasis option.

- **Sensitive Areas:** A number of LRMPs have recommended one or more sensitive areas for designation under the Forest Practices Code. To date, this tool has not been implemented pursuant to any SLUP recommendation.

- **Other Special Designations:** A significant creation of the Fort St John, Fort Nelson and Mackenzie LRMPs was the establishment of the Muskwa-Kechika Management Area. Legislated under the Muskwa-Kechika Act, provisions for environmental values largely require lower levels of planning (landscape unit planning, recreational planning and pre-tenure planning) prior to development. The area is not protected but because of its legislated profile and requirement for local level planning, it can be considered to provide a high level of conservation for key predator-prey systems and wilderness attributes.

  Although not a direct outcome of the Kootenay Boundary Land Use Plan, the Southern Rocky Mountain Conservation Area designation under the Environment and Land Use Act captures the conservation objectives from the strategic land use plan, and enables a more detailed, localized planning process. The SRMCA is under review, but will enable sustainable management of environmental values if the designation is retained and the KBLUP conservation objectives are brought into a wildlife management plan for the area.

C. *Special Management Zones*[56]

Differential zonation of the industrial land base is a key product of SLUPs. Special management zones (SMZs) are designated where the conservation of one or more environmental values such as wildlife, habitat, community watersheds, recreation or scenic values are a management priority. As of December 2000, SLUPs resulted in about 14% of the province under special management (or about 20% of the land base actually covered by a SLUP).

It is generally expected that where SMZs provide management direction that varies from standard practices, this will benefit environmental values. Implementation of this direction has been varied across the province. The Forest Practice Board 2000 Annual Report states that 'The absence of Higher Level Plans...makes it difficult to determine what's expected of licensees and statutory decision-makers in forest development planning. The Code does not require that forest development plans address landscape-level objectives that have not been formally established as Higher Level Plans."

- **Biodiversity:** In most SLUPs, SMZs have a greater proportion of 'high' and 'intermediate' Biodiversity Emphasis Options (BEOs). Consequently, maintenance of biodiversity is considered to be 'at less risk' because a larger percentage of old forests should be retained. BEOs are implemented through landscape unit planning, which has been completed for less than 5% of the province. Landscape unit planning is currently expected to be completed within the next three years.

---

[56] **Sources**: *Implementing Special Management Zones, Final Report of the Special Management Zone Working Group*, LUCO, January 2001. Also, *Keeping the Special in Special Management Zones, A Citizens' Guide*, BC Spaces for Nature, May 1998.

Biodiversity elements such as maintaining regional and local connectivity, distribution of other seral forest conditions, and maintaining interior forest conditions are prioritized in some SMZs, but degree of implementation remains low in areas where these provisions have not been legalized through higher level plans.

For example, until 2001, special management implementation on Vancouver Island was restricted to stand management direction at the cutblock level due to the absence of landscape unit planning to guide forest development plans, and due to the lack of a legal higher level plan. A Higher Level Plan, established December 1, 2000, has influenced forest development plans in SMZs since April 1st, 2001.

- **Fish and Wildlife Habitat:** In most SLUPs, the amount of high value habitat in SMZs is proportionally greater for provincially significant species such as caribou, grizzly bears and Bull trout. For example, although SMZs cover about 20% of the area in SLUPs, they include over 40% of areas with high and very high caribou habitat. For SLUPs in the Omineca-Peace region that have reported grizzly bear habitat by resource management zone, just over 40% of high and moderate value habitat is in SMZs. Again, legal designation may be required before conservation of environmental values can be assured. An administrative review of the Forest Practices Board versus Kootenay Lake Forest District found that the Kootenay Boundary Land Use Plan caribou guidelines were not required to be addressed through forest development plans, because there was no Higher Level Plan in effect. The Kootenay Boundary Higher Level Plan, established January 31, 2001, has influenced forest development plans in the region since June 1, 2001.
- **Water**: Many community watersheds under the Forest Practices Code are included in SMZs. For example, all community watersheds in the Kamloops and Kispiox LRMPs are in SMZs. SMZs sometimes capture key domestic water use areas not designated as community watersheds under the Code. While some domestic water protection provisions have been included in the Kootenay Boundary Higher Level Plan it is not clear that management that differs from the Code is being employed elsewhere.

D. Management Direction that Varies from Standard Practice

Land use planning tables have been free to recommend management direction that varies from standard practice and in most cases (but not all), SLUPs have provided some direction that is less constrained than the Forest Practices Code for some values. As defined following, these include:

- Landscape level biodiversity
- Stand level biodiversity direction
- Specific wildlife objectives
- Fish and riparian protection
- Access management

Landscape Level Biodiversity:

A number of SLUPs allow for full application of the Biodiversity Guidebook seral targets, either over the full plan area or within limited SMZs. However, because this direction conflicts with MoF policy, it requires a Higher Level Plan (HLP) to enable implementation. In areas without a HLP, full biodiversity implementation is not occurring. Four HLPs were established in 2000, which address application of the Biodiversity Guidebook. The Lakes, Bulkley, and Kootenay Boundary HLPs enable mature seral retention over the entire plan area. Vancouver Island HLP enables specific biodiversity provisions in SMZs, which comprise about 8% of the plan area.

The Lakes HLP includes additional provisions for old growth representation below variant level, and maintenance of interior forest conditions. However, the increase (almost double) in allowable annual cut due to Mountain Pine Beetle infestation is likely to undermine the ability to meet the HLP provisions. The Bulkley HLP provides for no new range permits, along with no harvesting in core ecosystems. The Kootenay Boundary HLP offsets the costs of mature forest retention with reduced green-up and increased patch size, but these cost-saving provisions are expected to better emulate natural disturbance conditions. Overall, it is expected that these HLPs will provide some benefits to environmental values over time, but it needs to be noted that these provisions are no more than were envisaged as part of the standard Forest Practices Code in 1995.

Landscape unit provisions under the Okanagan Shuswap LRMP fall below provincial standards, and provisions in the Mackenzie LRMP differ considerably. It is not clear at this point if these provisions will be implemented in the absence of HLPs, and environmental impact assessment of these provisions has not been carried out.

Stand Level Biodiversity Direction:

Most SLUPs follow provincial policy on stand level biodiversity, for coarse woody debris and wildlife trees. Stand level management is usually considered too detailed for discussion at strategic planning tables. Wildlife tree retention follows provincial policy, targets are set at the district level according to MoF policy, and cost impacts are projected to be within the limits set for Code implementation.

Regarding coarse woody debris retention, provincial utilization standards allow for little more than zero waste, with coastal and interior limits. Pilot studies are underway to assess the degree to which unavoidable waste meets environmental needs. The provincial policy prevents quantitative objectives for coarse woody debris from being set, although it appears that some additional retention of coarse woody debris may be occurring under the Robson Valley, Kamloops, and Okanagan Shuswap LRMPs, however this is not well documented and has not been monitored.

Specific Wildlife Objectives:

Some SLUPs provide species management objectives that exceed provincial policy and would provide benefits to specific values if implementation is enabled through HLP or changes to policy.

For example, the Fort St. John LRMP provides objectives for Red- and Blue-Listed species, caribou and ungulate winter range but in the absence of an HLP, management defaults to the provincial Identified Wildlife Management Strategy which allows a 1% impact to timber supply by forest district. The process for establishing wildlife habitat areas under the IWMS is slow (as of September 2001, 41 had been established, amounting to 8,185 hectares provincially).

In some cases, SLUPs recommend changes to provincial policy that utilize the same timber supply impacts but allow for different distribution, for example the Okanagan-Shuswap LRMP allows the application of the 1% IWMS budget for non-IWMS species.

Other SLUPs include species objectives from older plans or agreements that are current practice. For example, some Omineca-Peace region caribou guidelines are being implemented in the absence of an HLP; additional protection for Grizzly Bears on avalanche chutes is being implemented in the Robson Valley LRMP; buffer zones for bear and badger are being implemented through the Kamloops LRMP. These environmental benefits may not be directly attributed to SLUPs.

Where species management objectives are legalized through HLPs, such as direction for ungulate winter range in the Bulkley LRMP, increased seral retention for caribou in the Lakes LRMP, and in the Kootenay Boundary Land Use Plan, environmental benefits are more assured.

Fish and Riparian Protection:

Generally, SLUPs provide modest direction for fish and riparian values, and mostly default to the Riparian Management Area Guidebook. In some LRMPs, best management practices are recommended but may not be occurring in the absence of an HLP. Similarly, watershed assessments for Bull trout would be triggered in some areas if HLPs were adopted, as would access provisions around Bull trout congregation areas.

The Bulkley LRMP has identified important river corridors where rotation age is increased and smaller cutblock size is required. Also, the HLP provides for water quality for critical spawning areas and community watersheds, although this direction is rather general. In the Robson Valley LRMP, 'best management practices' are being applied, with additional riparian protection for a number of rivers. Road development will also be restricted in a number of areas.

Potential outcomes for a number of Omineca-Peace LRMPs, as well as Kamloops and Kispiox LRMPs have been identified by Fisheries and Oceans Canada (FOC). FOC identifies areas where salmon protection remains unchanged or is in decline, as well as areas that have the potential for increased protection. These are 'potential' outcomes and have not been monitored at this time.

Overall, FOC feels that the most significant and tangible outcomes of LRMPs in terms of fish habitat protection have been protected area designations and priority watershed assessments. Other than these provisions, FOC believes that strategic land use plans have not resulted in significant additional protection or enhanced management of fish habitat. (**Source**:*A n Evaluation of DFO Involvement in LRMP in BC*, March 1999)

Access Management:

There is a strong base of scientific literature that describes road and access related impacts to environmental values, including direct loss of wildlife habitat; reduction in effectiveness of habitat adjacent to roads; displacement of wildlife due to increased human access; barriers to wildlife dispersal, increased hunting and angling (including poaching) pressures on wildlife, etc. In BC, increased access has led to detrimental impacts on sensitive wildlife populations such as Grizzly bear, Bull trout and Mountain Caribou.

Most SLUPs identify access issues and provide some access management direction, including access management guidelines, enhanced referral processes, recommendations for restoration and deactivation, and numerous recommendations for developing coordinated access management plans and local level plans to address access. Pursuant to the LRMP, the Vanderhoof Access Management Plan covers a broad range of access issues. The Fort St. James Northern Long Term Roads Corridor Plan is LRMP directed, while the Golden Forest District is currently developing a District Recreation Access Plan in association with landscape unit planning.

A variety of legislative tools exist under the Forest Practices Code, the Wildlife Act, the Land Act, and the Mining Rights Amendment Act, however, there is considerable debate as to which agency manages access (particularly forest road access) and it does not appear that the Code provisions have been widely utilized. No 'applicable' Higher Level Plans under the Mining Rights Amendment Act (which influence special use permits for mineral exploration roads) have been established. Until access management planning is implemented and monitored, it is not possible to assess the benefits of SLUPs in this regard.

4.1.3 Impacts of SLUPs on Caribou and Grizzly Bear

Caribou and Grizzly Bear are two managed wildlife species in B.C. that received particular attention in SLUPs and the PAS. As noted earlier, SMZs were frequently designated with management direction for caribou and/or grizzly bear habitat, and these species also often received consideration in establishing PAs.

Caribou

Prior to European settlement it is estimated there were about 40,000 caribou in B.C. The current provincial total is about 18,800. Three Woodland Caribou ecotypes are recognized in BC including approximately 2,300 Mountain Caribou, 15,750 Northern Caribou and 725 Boreal Caribou (Heard and Vagt 1996). British Columbia is home to 98% of the world's Mountain Caribou and these have been extirpated from approximately 43% of their former range in the province, probably because of habitat loss, habitat fragmentation, predation, disturbance, and hunting (Heard and Vagt 1996; Simpson et al. 1997; Kinley 1999; Spalding 2000).

The provincial Conservation Data Center has identified all of the province's caribou to be at risk. The Mountain ecotype is Red-listed, and both the Boreal and Northern ecotypes are Blue-listed. Only one caribou subpopulation in the province is currently increasing, while 10, generally in the southern half of the province are known to be in decline. For the majority of the remaining subpopulations, the trend is unknown.

Recovery of caribou in BC is largely dependent on the ability of strategic land use plans to prevent destruction of critical habitats, provide large contiguous areas of old forest, promote forestry that emulates natural disturbance, concentrate negative impacts in space and time to minimize disturbance, and develop recreation and access management strategies that limit or prohibit access in certain areas at critical times. All SLUPs within the caribou range have made management of caribou and their habitat a high priority. For example, although SMZs cover about 20% of the area in SLUPs, they include over 40% of areas with high and very high caribou habitat. Implementation of these SLUPs is fundamental to current caribou recovery planning.

Protected areas appear to cover significant portions (but not all) of the ranges of 6 of the province's 44 caribou subpopulations (Edziza, Spatsizi, Muskwa, Tweedsmuir, North Wells Gray, possibly Itchuz-Ilgatchuz). Although protected areas are important to a few subpopulations, the overall contribution of PAs to woodland caribou habitat conservation in BC is minimal. Caribou subpopulations utilize such large areas that the PAs are generally too small to contain a subpopulation throughout its annual cycle (Mountain Caribou Technical Advisory Committee). Overall PAs play a minor role in terms of caribou population conservation.

Grizzly Bear[57]

A 1990 assessment of grizzly bears in Canada suggests that Canada is home to one half of North America's grizzly bears, and British Columbia is estimated to have nearly half of the remaining Canadian population.

British Columbia is one of the last remaining places on earth where grizzly bears can still be found in relative abundance. However, grizzly bears are being adversely affected by our rapidly rising population, urban development, land use and other human activities.

The Ministry of Water, Land and Air Protection (WLAP) estimates that up to 20% of the current grizzly population of BC is now in PAs and ELUCs. Several of the new PAs stand out as being 'good' for grizzly bears including Tatshenshini – Alsek, Northern Rocky Mountains, Kitlope, Stikine River and Khutzeymateen. Also 'pretty good' are Cariboo Mountains, Ts'yl-os, Goat Range, Upper Sustat and Upper Kispiox. One cannot expect to meet the long term objectives of the Grizzly Bear Conservation Strategy by trying to relegate grizzly bears to PAs, especially if those parks combine extensive recreation management objectives with conservation.

A number of SLUPs gave grizzly bear habitat a high profile at the planning tables. The LRMP process in Kalum endorsed the designation of the province's first Grizzly Bear Management Areas, the Kispiox LRMP gave special consideration to grizzly habitat, as did the KBLUP. Grizzly bears were considered in each of the Kamloops, Ft. St. John, Ft. Nelson, Okanagan Shushwap, MacKenzie and Cassiar/Stikine/Iskut LRMPs. How much of this consideration has been translated into Higher Level Plan language and is being implemented is an open question.

A very general assessment by WLAP staff is that provincially, SLUPs and the PAS "have given us the difference between Very High Risk before them to High Risk now", in terms of the long term sustainability of the grizzly population. If greater strides had been made in access management, the risk could have been reduced even further.

4.1.4 Difficulties of Assessing Impacts of SLUPs on Environmental Values

It is important to note that the SLUP program has been underway for less than 10 years, and the implementation of SLUPs is in its early stages across the province. Regardless, time and experience alone are unlikely to provide clear answers about the effects of the SLUP program on environmental values for three main reasons:

- environmental management objectives and targets in SLUPs are often vague, unclear or conflicting;
- the base case values (against which change will be compared) are rarely described; and
- relatively little effort is invested in monitoring and adaptive management programs.

Generality of Management Objectives and Strategies of SLUPs

Environmental management objectives and strategies of SLUPs have often been criticized as being too general and open to various interpretations. The consensus-based nature of planning tables has necessarily resulted in generalized wording acceptable to all parties. In some cases, notably, the three regional land use plans, considerable work has gone into refining and interpreting management direction, integrating potentially conflicting objectives and targets, and developing implementation strategies. Where Higher Level Plans have been developed, interpretation has been clarified in most cases. Nevertheless, because of lack of clarity and conflicting messages found in many SLUPs, difficulty remains in ascertaining how to implement them. (For instance, what takes priority in a landscape unit that allows for an increase in grazing while at the same time requires the protection of ungulate winter range?). Overall, assessment of environmental outcomes will depend in part on expectations built within the plans, and these expectations vary between agencies and interest groups.

---

[57] This section is based on an e-mail submission from the Ministry of Water, Land and Air Protection, October 2001.

Base Case Assessment of Environmental Values

Socio-economic assessment of SLUPs focuses on describing the 'base case', taken as current conditions and management, and compares this base case with alternate management scenarios provided by the completed SLUP. In contrast, in order to assess risk to environmental values, preliminary assessment of environmental conditions must compare current and projected ranges of conditions against a benchmark of natural, historic conditions and range of natural variability, i.e. the current status of environmental conditions is not the starting point by which to assess sustainability of environmental values. However, environmental impact assessment associated with SLUPs to date has not included an environmental benchmark of natural conditions, nor has a comprehensive risk assessment methodology been applied. This has largely been due to a lack of understanding of the process, a lack of resources, and the focus on socio-economic assessment.

It should be noted that the presentation of environmental information in terms of risk is becoming increasingly common in various disciplines and jurisdictions. Several bills have been introduced in the US Congress mandating that agencies use risk assessment to set priorities and budgets (e.g Environmental Risk Reduction Act), and scientific panels such as the National Research Council have made similar recommendations.

Monitoring of Impacts on Environmental Values

Environmental impacts of SLUPs will depend on full implementation of management direction, timely monitoring, and adaptive management where appropriate. Given that strategic land use planning began less than a decade ago, and approval and implementation of these plans has been staggered throughout this period, the necessary monitoring programs - implementation monitoring, compliance monitoring, and effectiveness monitoring - have barely been initiated and are severely limited by lack of resources. Demonstration of effectiveness will depend on the full implementation of SLUPs, which has been delayed in various areas due to legislative and policy conflicts. Degree of effectiveness of SLUPs for sustaining environmental values may also take considerable time to emerge, will be difficult to separate from other factors affecting environmental values (e.g. climate change), and for some values, monitoring will require cumulative impact assessment coordinated across the province.

4.1.5 Qualitative Insights into SLUP Impacts on Environmental Values

The following table provides the results of detailed interviews with six environmental representatives. This includes 4 employees from the Ministry of Environment, Lands and Parks and two environmental sector representatives (one from the Vanderhoof LRMP and one from the Cassiar-Iskut-Stikine LRMP). More detail is provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on Environmental Outcomes***
Changes in the frequency or intensity of Crown land disputes	Four interviewees believe that SLUPs decreased the frequency or intensity of land use conflicts and two believe that there has not been a change. • Conflicts were reduced in areas where SLUPs have occurred compared to areas where they haven't. • SLUPs have provided more stability – the only groups that still appear to object are the mining industry and First Nations. • Disputes are likely to continue if plans are not well developed or if implementation does not reflect the agreed upon direction in the SLUP. • One respondent commented that the fact that conflicts have decreased does not mean that environmental concerns have diminished; they have been redirected to other processes such as landscape unit planning and forest certification.
Changes in managing for environmental values	Most interviewees believe that SLUPs led to changes in managing for environmental values. • SLUPs provide resource inventories, local knowledge, improved integration and communication among agencies and accountability for agencies to implement plans and report to local communities • SLUPs provide clear direction for future management and have helped to improve awareness and understanding of environmental issues. • One respondent indicated that it is too early to tell whether changes have occurred until plans are implemented and monitoring is carried out • One interviewee believes that Higher Level Plans offer the only vehicle by which change can actually be implemented.
Impacts on specific environmental values	All of the respondents believe that SLUPs had either a positive impact or no change on specific environmental values, except in one instance where an LRMP is believed to have led to less rigorous biodiversity requirements. • Half of the interviewees believe that SLUPs will lead to a decrease in negative impacts on fish, and half believe that there will be no effect on fish resources. One respondent believes that SLUPs dealt with recreational values for fish rather than habitat and species concerns. • All respondents believe that SLUPs reduced negative impacts for wildlife. Examples of wildlife benefits include Caribou management areas, ungulate winter range, and grizzly bear habitat. • Half of the respondents believe that SLUPs have had a positive impact on water resources, and half believe that SLUPs had no effect on water. It was pointed out that water issues have not been addressed at a broad scale (e.g., regional aquatic management, water quality/quantity, etc.) • Half of the respondents believe that SLUPs have led to a decrease in negative biodiversity impacts and another two believe that biodiversity impacts remained the same. SLUPs helped to raise the profile and level of understanding about biodiversity issues, however, there was more of a focus on ecosystem representation than on

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on Environmental Outcomes***
	managing for biodiversity. One respondent believes that in the Okanagan Shuswap LRMP, biodiversity management requirements are less than current management requirements in the Landscape Unit Planning guidebook.
Impacts on level of land use certainty	All interviewees believe that SLUPs have increased land use certainty. • SLUPs have provided much more clarity about what resources exist on the land base and have provided clear direction for how values should be managed through zoning and resource management objectives.
Change in level and emphasis of activism by the environmental organizations in BC	Most respondents believe that SLUPs have altered the level and emphasis of activism by environmental organizations in BC. • In general, environmental organizations have begun to work more collaboratively with government agencies and other stakeholder groups as a result of SLUPs. • SLUPs have helped to raise the profile of environmental objectives. • In areas where SLUPS have not been well implemented, the level of environmental conflict has persisted or increased (e.g., Kootenays and Elaho Valley) • One interviewee commented that some ENGOs now believe that SLUPs have resulted in achievement of key objectives while others believe that more still needs to be done.
Impact on public awareness of environmental issues	All respondents believe that SLUPs have led to an increase in public awareness of environmental issues. • SLUPs have made the public more aware and involved and have helped to educate various stakeholder groups at planning tables about environmental issues. • One interviewee pointed out that future work would benefit from the front-end loading that has occurred in terms of building environmental information and awareness.
Impact on the ability and capacity of the provincial government to manage for environmental values	Most interviewees believe that SLUPs have increased the ability and capacity of the provincial government to manage for environmental values. • SLUPs have provided government with increased information and knowledge and with strategic direction and momentum to carry out other levels of planning (e.g., Landscape Unit Planning). At the same time there is a concern that there has been no increase in financial and human resources to implement SLUPs. • One interviewee felt that more intense levels of resource development on the rest of the land base would offset any improvements in environmental management, in order to maintain a balance between environmental and industrial benefits.
Impacts on capacity for environmental organizations to participate in and support land use planning processes	All interviewees believe that SLUPs increased the capacity for environmental organizations to participate in and support land use planning processes. • Increases in data and inventory have played a big part in increasing capacity. • One respondent pointed out that it would be a challenge to channel the increase in capacity in plan development into effective involvement in the implementation phase • Concern was expressed that environmental participants in SLUP processes are beginning to become "burned out".

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on*** ***Environmental Outcomes***
Impacts on land and resource inventory data that is available to environmental organizations	All respondents indicated that SLUPs increased the availability of land and resource inventory to environmental organizations. • A lot of money has been invested in developing inventory, which has resulted in better resource mapping. • Access to information has been provided through websites. • Carrying out the management objectives in SLUPs will lead to the assembly of even more inventory and data. • SLUPs will help to define priorities for future inventory work.
Impacts on communication with govt. agencies, stakeholders, and First Nations	Most respondents believe that SLUPs have led to improved communications between environmental groups, and government agencies and other stakeholder groups. • Half of the respondents believe that communications with First Nations are slightly better and half believe there has been no change. • One respondent commented that even though First Nations have not been directly involved in most SLUP processes, there has been a lot of dialogue and relationship building leading to reduced conflict. • Communication has improved noticeably between agencies and between forest companies and environmental groups as well as between local governments and the provincial government.

4.2 First Nations

It is beyond the scope of this study to assess the SLUP impacts on First Nations. In order to provide context for this socio-economic study, it is nevertheless important to provide some general insight into the SLUP impacts on First Nations. As part of this work, the analysts conducted interviews with five First Nation representatives including representatives from the Tahltan First Nation, the Office of the Wetsuwet'en, the Tshimshiam Tribal Council, the Kwadacha First Nation and the Little Shuswap Indian Band. All interviewees have been directly involved with SLUPs and two have been involved with more than one SLUP.

The following table summarizes the results of these interviews. More detail is provided in the Appendices.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on*** ***First Nations***
Changes in the frequency or intensity of Crown land disputes	• Most interviewees indicated that there has been no change in the frequency or intensity of disputes as a result of SLUPs and one believed that conflicts had decreased slightly. • It was suggested that the purpose of land use plans was not to end environmental activism, but rather to produce good solid plans for the future. • One interviewee stated that the LRMP process has provided empowerment – i.e., it provided a process where equal partners were sitting at the table resolving issues. There has been an extraordinary change within a period of 3 years. • One representative believes that SLUPs will prejudice future treaty negotiations and that they are not addressing land use conflicts, but instead further compounding them.
Changes in	

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on First Nations***
economic activity in communities	• Most interviewees indicated that SLUPs have led to changes in economic activity in communities. • One respondent felt that SLUPs could potentially reduce opportunities because resources were being allocated to other uses that would preclude First Nation access (e.g., forest tenures). • Two respondents pointed out that SLUPs had provided immediate opportunities in forestry (e.g., an opportunity to bid on forest licences and contract harvesting in areas with traditional value). Other respondents believed that SLUPs would provide benefits in the future (e.g., ecotourism, forestry, fisheries, mining, etc.).
Changes in economic diversification	• Four of the five interviewees believe that SLUPs have led to changes in economic diversification in communities. Examples include tourism (ecotourism, front country tourism, cat-skiing, etc.), access to a forest license, and silviculture and forest health contract opportunities. • One respondent from the Northeast indicated that there has been a shift from a forest-based economy to a larger and more diverse economy. • One respondent from the Northwest indicated that First Nation communities had a negative perception of the outcomes to be provided through LRMPs.
Impacts on level of land use certainty	• Four of five interviewees believe that SLUPs have increased land use certainty (two indicated that the increase has been significant) and one interviewee believes that land use certainty has remained about the same. • It was pointed out that SLUPs have contributed to a heightened awareness of land use issues and that First Nations now have more of an opportunity to participate in land use management. • Some respondents believe that land use certainty will increase over time as implementation is carried out. One respondent indicated that the LRMP could serve as a useful information tool to support treaty negotiation.
Impact on investment plans because of changes in land use certainty	• Three of the five respondents do not know of any operations that have altered their investment plans because of changes in land use certainty. • Three examples were provided where investments (or investment plans) have increased and one example was provided where a forest licensee decreased its investment following the LRMP.
Impacts on community growth	• Three respondents indicated that SLUPs are not viewed as a limitation to growth in their communities; one indicated that SLUPs are seen as a limitation to growth and one didn't know. • There was a sense that SLUPs have provided opportunities for communities to grow together and improve working relationships and one respondent indicated that the LRMP could provide impetus for growth. • One respondent indicated that land use designations in the SLUP could restrict future opportunities for First Nations (e.g., areas zoned for motorized access).
Impacts on "community capacity"	• Three interviewees believe that SLUPs have enhanced "community capacity" and two believe there has been no enhancement. • Examples of where capacity has been increased included financial assistance from the provincial government, improved understanding by other communities and

Indicators for MAA Evaluation	*Impact Assessment of SLUPs on* ***First Nations***
	stakeholders of First Nations' values and interests, and the formation of land use planning organizations and structures within First Nations governance systems. • Two respondents indicated that SLUPS had helped to increase an understanding of resource management issues, but hadn't resulted in any capacity to be able to do anything about it.
Changes in the capacity of First Nations to undertake land and resource management planning	• All five respondents believe that SLUPs have led to changes in the capacity of First Nations to undertake land and resource management planning. • It was noted that even though the information is there, First Nations do not necessarily have the capacity to use it. • It was also pointed out that SLUPs have provided First Nations with an opportunity to gain an improved understanding of the interests and values of other stakeholders.
Impact on the protection of First Nation traditional values	• Three of five respondents believe that SLUPs have led to better protection of traditional values that are of interest to First Nations and two indicated that they have not. • SLUPs have contributed to a heightened awareness of First Nation values, which in some cases has translated into improved management (e.g., referral process, identification of values such as medicinal plants and traditional travel routes, etc.).
Improvements in land and resource inventory data that is available to First Nations	• Four of five respondents believe that SLUPs have led to improvements in making land and resource inventory data available to First Nations. • There is still a need for more data (e.g., wildlife inventory). • Much of the existing data is not practicable and readily accessible to First Nation communities. • It is important to develop data protocols with government and other stakeholders to ensure data consistency.
Impacts on communication with govt. agencies and stakeholders	• All respondents believe that SLUPs have led to improved communications with government agencies and other stakeholder groups. • Improved communication has led to an increased understanding of First Nation values by government and other stakeholders • First Nations have also gained an improved understanding of the values and interests of the government and other stakeholders.

4.3 Other Interests

There are many other interests, which have not been discussed thus far. They include: resource based communities in rural B.C., the public sector/ government financial implications of crown land use plans and social interests that flow from the economic impacts such as jobs, but which are not captured in the overall analysis.

It is beyond the scope of this study to cover these other interests in detail. However, as part of this study, the consultants conducted a few interviews with municipal leaders and others who had been involved in SLUPs across the province. This section summarizes the comments from these interviewees and presents data on the LUCO base operating budget as well as other costs associated with land use initiatives of the B.C. government.

4.3.1 Community and Other

Fifteen interviews were conducted in sectors other than those covered up to this point. These include:

- Eight community representatives including the Mayors of four communities, three administrators/ economic development representatives and one representative from the Union of B.C. Municipalities;
- Five government representatives from LUCO, MEM and MOF; and
- Two interviews with beef cattle industry representatives.

Many of the above interviewees commented on specific industry sectors such as forestry, mining and agriculture, and these were considered in the primary sector analysis. This section includes, however, the more general comments on the SLUP impacts on overall investment levels, land use certainty and the impacts on conflict and communication between stakeholder groups. These are summarized in the following table.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on Community and Other Interests (Includes 8 community representatives, 5 LUCO and other government representatives and 2 representatives of the beef cattle sector)***
Impact on investment	Twelve interviewees commented on whether SLUPs had an impact on investment in their sector or community. Their comments were as follows: • 3 believed that SLUPs had a positive impact on investment (2 agency representatives and one community representative). • 4 believed that SLUPs had no impact. Some mentioned that the LRMP is often wrongly blamed for a drop in timber harvest levels or declining investment in the mining sector, but markets dictate investment. • 5 believed SLUPs had a negative impact on investment. These are mainly the community representatives from resource based communities that have suffered in recent years because of the downturn in the economy. In general, these individuals noted that SLUPs played a minor role in negatively affecting investment but that the effect was negative.
Impacts on level of land use certainty	Of fourteen interviewees, 11 believe that SLUPs increased land use certainty. The other three believe that SLUPs had no impact on land use certainty. None of those 14 interviewees believe that SLUPs decreased land use certainty.
Impacts on resource inventory developed by governments	In general, government and community representatives believe that SLUPs have led to much better or better inventories developed by governments. SLUPs are resulting in more and better resource inventories but SLUPs are also helping to prioritize where resource inventories are most needed. One community representative is concerned that better resource inventories do not always lead to better decisions.
Impacts on local/provincial conflicts	Eleven out of 12 interviewees believe that SLUPs helped decrease conflicts between environmental groups and the forest industry. SLUPs also helped resolve conflicts with other stakeholders such as recreationists and tourism operators although many recognized that there were fewer conflicts with these groups prior to SLUPs and as a result, the impacts of SLUPs on conflict with these sectors are less significant. SLUPs helped reduce conflict with First Nations only in the few areas where they have actively participated in the process.

Indicators for MAA Evaluation	***Impact Assessment of SLUPs on Community and Other Interests (Includes 8 community representatives, 5 LUCO and other government representatives and 2 representatives of the beef cattle sector)***
Impacts on communication between stakeholders and between government agencies	Government agency and community representatives generally believe that SLUPs have led to better communication between stakeholders. The exceptions are representatives in regions where SLUPs have yet to be completed and in the Kootenays. Also, one community representative in the Northern Interior believed that SLUPs improved communications within the few people who took an active part in the SLUP, but did not lead to broader public input and communication among stakeholders. Also, communication with First Nations only improved where First Nations chose to participate in the SLUPs (i.e. in Central Coast and some of the more recently completed B.C. Interior SLUPs. Government agency and community representatives generally believe that SLUPs have had a positive impact on communication between the various agencies and that this has led to better cooperation and efficiency in land management. For many interviewees, this has been one of the greatest benefits of SLUPs.

4.3.2 Government Funding of Strategic Land Use Plans

Many of the individuals interviewed as part of this study expressed concern over the administration costs associated with SLUPs. It is beyond the scope of this study to estimate what these administrative costs might be. A full review of administrative costs would include the LUCO and agency administrative costs of SLUPs as well as the costs within each stakeholder group. A complete review would also require an analysis of how SLUP funding may be lowering costs in other aspects of government administration. For example, SLUP funding includes the costs of Inter-Agency Management Committee (IAMCs) meetings that would likely take place in some form regardless of SLUPs.

The following table outlines the LUCO operating budget for 2001/2002 as projected in the spring of 2001, and the various SLUP related funds that were managed by LUCO at that time.

Table 27 LUCO Operating Budget and SLUP Related Funds, 2001-2002

	$ Millions (2001/2002)
LUCO Operating Budget (47 Person Years)	$ 4.3 million
SLUP Related Funds Administered by LUCO	
• Corporate Resources Inventory Initiative (CRII)	$ 3.8 million
• Muskwa-Kechika Trust Fund	$ 3.0 million
• Crown Land Use Planning Enhancement (CLUPE) program/ Forest Renewal BC	$ 3.7 million
Total SLUP Funds Administered by LUCO	$ 10.5 million

Notes:

1. Excludes $5 million over five years for the B.C. component of the Trans-Canada Trail.
2. Represents the operating budget for LUCO for 2001/2002 as was proposed in spring 2001.

Source: LUCO, spring 2001.

5. Summary and Conclusions

The purpose of this study is to gain a provincial perspective on the economic impacts of SLUPs and the PAS on B.C. During the course of the SLUP process, individual plan areas, and individual polygons within plan areas, benefited from some rigorous analysis of resource inventories, conflicting land uses, complementary land uses, trade-offs and impact assessments. These analyses drew on a wide variety of sometimes locally unique data sources (including the local knowledge of SLUP table participants), and used an equally wide variety of methodologies to assess the expected impacts of the plans. While the divergence in types of data sources and analytical techniques likely led to better impact assessments for each plan, it largely precluded being able to aggregate the impacts to gain a provincial perspective.

For this study, assessing provincial impacts required finding indicators that were consistent across all (or most) plan areas, and applying a consistent methodology to the impact assessment. Achieving uniformity for some of the indicators led to a loss of precision at the individual plan level, which was regrettable, but necessary. Similarly, the observed or measured impacts of the plans at the provincial level are somewhat less specific than those detailed in the SEAs for individual plans.

This analysis focuses on the major industrial sectors that depend on the land base. It was outside the scope of this project to assess the SLUP impacts on First Nations, resource based communities and environmental values, however, to help set the context for the work, the project also provides some insight into the SLUP impacts on those values.

The research for this project included a review of Geographic Information System (GIS) quantitative data prepared by LUCO that show various resource values overlain by the land use zoning designations adopted by the various plans. In addition, 76 detailed interviews with stakeholders provided qualitative data on the impacts of SLUPs on various indicators such as land use certainty, investment levels, incidence of conflicts, communication and many others.

The analysis uses some of the key elements of a Multiple Account Analysis (MAA) framework including the Base Case concept. For the purpose of this analysis, the Base Case assumes that the land use designations in effect in 1991 would have continued to prevail. The analysis therefore attributes all of the economic impacts of the new PAs and zone designations to the PAS and SLUPs. (It should be noted that it is highly unlikely that all of the new PAs would have been open to extractive resource development in the absence of SLUPs and the PAS, particularly since some of them were already designated as recreation or wilderness areas).

As noted in the introduction to this report, SLUPs have been credited with providing a number of important benefits, but at the same time, have been criticized for imposing some costs. As a conclusion to this report, the following reviews the initial list of suggested costs and benefits and summarizes the evidence of their existence and magnitude.

Initial List of Potential Benefits Associated with SLUPs

- **A reduction in conflict over land and resource use**: The interviews suggest that SLUPs have succeeded to some degree in reducing conflict. Land use conflicts involving the forest industry are perceived to have been reduced (or pre-empted) in many areas with the exceptions of the Kootenays, and in some parts of Coastal B.C. particularly where SLUPs have not yet been complete. Conflicts have been reduced on Vancouver Island, which is one of the few areas on the Coast where an SLUP has been completed. Conflicts may have been pre-empted for the oil and gas sector, and somewhat reduced for the tourism and recreation sectors. Conflicts involving First Nations have not been significantly affected by SLUPs, and the mining industry believes that conflicts with environmentalists have actually increased because of SLUPs and the PAS.

- **Increased stability and certainty in land use and resource management** Most stakeholders believe that SLUPs have generally led to greater land use certainty, except in the Kootenays, and in some regions of Coastal B.C. where SLUPs have not yet been complete. SLUPs have, so far, led to less certainty regarding land use and management direction in SMZs, particularly for the mining sector.

- **Increase in the Hectarage and Ecosystem Representation of PAs**: Between 1991 and 2001, total protected area increased from 5.3 million hectares to 11.9 million hectares and the proportion of B.C.'s terrestrial ecosections with at least 12% in PAs rose from 16% to 39% of the identified terrestrial ecosystems in the province. Also during that same time frame, the percentage of ecosections with less then 1% in PAs has dropped from 53% of the identified ecosystems in the province in 1991 to 12% by 2001.

- **Sustainable management of land and resources on Crown land**: SLUPs have led to changes in managing for environmental values and have helped raise public awareness of environmental objectives and sustainable development.

- **A more efficient allocation of the land base**: Planning should be better than not planning if there is sufficient information available on resource values and social preferences. There is anecdotal and quantitative evidence from some plan areas that the planning process yielded social efficiencies in organizing land and resource use to maximize overall value (e.g. timber, biodiversity and wildlife habitat values are strategically managed to create more overall value than might have occurred from a more ad-hoc management regime). On the other hand, the mining industry has argued that there is not sufficient information available on sub-surface resource values to plan effectively, and that ad-hoc management would be preferred.

- **A framework to direct development and approval of operational plans and resource development permits**: SLUPs have provided a framework to the forest sector for approving Forest Development Plans (FDPs) and these are typically approved more quickly when in General zones and ERZs. In the oil and gas sector, SLUPs may have pre-empted permit delays in the northeast as most of the high drilling activity is taking place in General Zones and ERZs, although pre-tenure planning requirements are resulting in more delays in approving oil and gas drilling permits in the M-K region. The process has not been fully tested for other sectors such as mining development.

- **Improved natural resource databases and analytical tools**: SLUPs have led to better inventories for environmental values, tourism, forestry and First Nations. Also, mineral potential assessment has been completed for all of B.C.

- **Improved management tools and processes for government agencies**: Government agency representatives generally believe that SLUPs have had a positive impact on communication between the various agencies and that this has led to better cooperation and efficiency in land management. For many interviewees, this has been one of the greatest benefits of SLUPs.

- **Increased community capacity** (e.g., improved skills, understanding, and ability in land use planning): SLUPs have helped develop the capacity of First Nations and resource-based communities to take part in land use planning decisions, however, this seems to have been the case only for the few First Nations communities who took part in the SLUP process, and for those individuals in resource-based communities who played a key role in the process.

- **Clarification of land use objectives to assist treaty negotiations**: This study did not collect any data or opinions on how SLUPs affected treaty negotiations.

- **Increased public understanding and awareness of resource use issues**: SLUPs have raised public awareness of environmental objectives and the complexities of integrated resource management.

- **Development of strategies to mitigate impacts related to changing social values**: The land use process has helped develop strategies to mitigate the impacts of new PAs on the forest sector, including the establishment of ERZs, and identifying strategies that the Ministry of Forests may wish to consider to maintain the AAC in the short and medium term in spite of impacts on the THLB.

Initial List of Potential Costs Associated with SLUPs

- **Reductions in the size of the timber harvesting land base (THLB)**: SLUPs and the PAS have negatively impacted the THLB, but appear to have avoided high capability forestlands to some degree, when establishing PAs. Many of the management directions suggested in SLUPs appear to fall within the broad range of the FPC, but for most planning areas the impacts of SMZs on the THLB have yet to be determined. There might be opportunities for the ERZs to offset to some degree, any negative impacts from SMZs, at least for the regions that chose to designate ERZs.

- **Negative impact on investment in mining exploration and development**: In B.C., some on-site mineral exploration has continued but more speculative exploration has essentially ceased. Obtaining financing for speculative exploration has been nearly impossible for the past several years. While these negative trends are not mainly the result of SLUPs and the PAS, B.C. does seem to have suffered more than other provinces. The mining industry's main point of contention with SLUPs and the PAS is the reduced likelihood that any mineral deposit, if found, would be developed in an SMZ, and particularly in the Muskwa-Kechika area or in proximity to a PA. The reduced exploration effort has negatively affected the development of mineral inventories in B.C.

- **Job losses associated with reductions in resource extraction and related activities**: This study suggests that once the SLUPs and PAS impacts are fully experienced, they may cause the loss of 2,000 PYs in primary forest employment and another 1,200 PYs in value added and other operations. Some 200 PYs in mineral exploration employment may have been lost in each of the past several years. In the longer term, the reduced exploration effort and perceived risks of attempting to develop deposits in SMZs may put metal mine development and metal mining operation jobs at risk. In the oil and gas sector in the Northeast, some 275 PYs may be jeopardized at some point in the future (the impacts on the oil and gas potential in other B.C. areas and coal bed methane were not assessed). It is not clear whether the SLUPs and the PAS will have a net positive impact on job opportunities in the tourism and recreation sectors.

- **Loss of economic base for resource dependent communities**: Resource-based communities in Coastal B.C. and in the Kootenays are likely to face the costs of SLUPs sooner than most other B.C. regions, where the negative impacts on forestry are likely to be deferred for at least 1 or 2 decades (some Coastal communities have already felt the impact of the VILUP and the PAS). In the longer term, some resource-based communities may bear the costs in terms of foregone opportunities in forestry, mining and oil and gas. These same communities may benefit from opportunities in tourism and recreation, which may develop over the longer term and could offset to some degree the foregone opportunities in extractive resource industries.

- **Increased costs for government agencies to implement management direction provided in plans** (e.g., protected area management plans): LUCO had an annual budget of $4.3 million and in addition, it administered some $10.5 million in various funds directed at preserving certain values (proposed budget for 2001/2002, spring 2001). This does not recognize the additional costs of participating in planning or managing resource values in the other agencies. Many interviewees suggested that the current level of resources being directed to land and resource management is not nearly sufficient to implement the plans.

- **Loss of government revenues**: The forest industry provided $1.4 billion in resource rents to the provincial government in 1999. Alienating 4.4% of the high capability forestland in new PAs could ultimately lead to a $56 million dollar reduction in annual stumpage, rents and royalties, but most of this impact will likely be deferred for several decades. The oil and gas sector provided $1.3 billion in rents, royalties and disposition bonuses to the provincial government in 2000. Slower growth in natural gas production and revenues due to new PAs and SMZs may result in an eventual annual loss of $60 million in government revenues (based on Fort Nelson, Fort St. John and Dawson Creek SEAs, 1996-1999). Direct mining taxes and fees related to tourism use are not significant in comparison, and any reduction in activity in these sectors due to SLUPs would have little direct impact on government resource rents (although of course, all sectors contribute through corporate income, other industry taxes and employee income taxes and other payments to government).

  In addition to the resource rent impacts, reduction in activity in any of these sectors would lead to other reductions in provincial government revenues such as sales taxes, corporate income taxes and personal income taxes.

- **Increased regulatory constraints for development approvals**. SLUPs have led to additional regulatory requirements for Forest Development Plans (FDPs) in SMZs in the Cariboo region and Low Intensity Zones in Vancouver Island where joint approval of MoF and MELP is required. The interviewees also perceive that there are increased regulatory constraints in the Muskwa-Kechika region because of the region's legislated status and requirements for local level planning.

The following tables summarize the impacts on various indicators for each major business sector affected by land use decisions (forestry, mining, oil and gas and tourism/recreation) and for First Nations, the Environment and other stakeholders.

Summary of Study Findings – Forestry, Mining, Oil and Gas, Tourism and Recreation

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
# of Interviews	20 interviews excluding MOF	12 interviews excluding MEM	5 interviews excluding MEM	13 interviews
Size of sector:				
Direct employment	90,600 PYs (1999 data) or 1.198 PYs per 000 m3 harvested Of this, 56,900 PYs is in primary logging, silviculture and primary wood processing (excluding pulp and paper, other value added and government)	9,540 PYs including 3,200 in coal mining; 950 in exploration; and 5,400 in metal mining & smelting Another 9,279 PYs are in the construction aggregate sector (2,879 PYs), aluminium smelting (1,800 PYs) and in downstream mineral processing (4,600 PYs)	Exploration and wellhead production generates some 7,000 PYs in B.C. (up from 5,300 PYs in 1998). Refining and downstream segment add another 9,200 PYs (excluding gas retailing).	Tourism/ recreation accounts for 110,800 part time and full time jobs (job estimate not comparable to goods producing sector); Backcountry tourism accounts for between 4% and 9% of tourism depending on measure used. An estimated 25% of tourism expenditures are for outdoor recreation on crown lands.
Average salary	$67,042 per PY (with benefits)	$74,850 per PY (with benefits)		$21,971 (BC Stats for 1999, not directly comparable to goods producing sector)
Indirect and Induced Impacts - Employment Ratios[58]	Number of indirect and induced jobs per direct jobs (1996): • Logging: 1.48 • Pulp and paper: 1.86 • Wood Manufacturing: 1.47	For each direct job, the mining and oil and gas sector generates an estimated 1.66 indirect and induced jobs per direct jobs (1996)	For each direct job, the mining and oil and gas sector generates an estimated 1.66 indirect and induced jobs per direct jobs (1996)	For each direct job, the tourism sector generates an estimated 1.16 indirect and induced jobs (1996)
BC Exports,	$15.5 billion	$1.4 billion (excludes coal)	$3.2 billion (includes coal, oil	$4.0 billion (estimated

---

[58] Source: Horne, G., *B.C. Local Area Economic Dependencies and Impact Ratios – 1996*, B.C. Ministry of Finance and Corporate Relations, 1999.

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
1999			and gas and power)	revenues from foreign visitors)
GDP	Approximately 23% of the goods producing sector (which accounts for 26% of GDP), or 6% of provincial GDP	The GDP for mining and oil and gas combined accounts for 4% of the provincial GDP.		4.8% of provincial GDP although estimates vary
Government revenues – direct taxes, excludes payroll taxes	$1.4 billion in stumpage, royalties and rent; another $1.1 billion in other industry payments to governments.	$29 million in mining and mineral taxes; total direct payments to governments add to $176 million in 2000 ($151 million to B.C. and $25 million to Canada).	$1.3 billion in direct payments to B.C. government in royalties and disposition bonuses; excludes other direct payments such as sales taxes and corporate income taxes	No royalty payment although some permit fees; no estimates of direct payments to governments (e.g. property/ school taxes, sales tax, etc.)
Industry Trends	Harvest from crown lands peaked at 82.3 million m3 and was the lowest in 1998 at 56.8 million m3.	$42 million of exploration expenditures spent in B.C. in 1999/2000, down from annual average of $197 million between 1987-1990. All 9 operating metal mines (2001) are projected to close in next 5 to 10 years.	Number of producing gas wells has more than tripled between 1989 and 2000.	Tourism in B.C. spiked in 1986, and has largely recovered from the recession of the early 1990s.
Would industry have developed differently without SLUPs	Comments from interviewees include: forest sector would have developed differently; planning areas may have been smaller; BC Interior would have attracted more attention from environmentalists. In the Kootenays, attitudes would be less polarized.	All interviewees in mining industry believe that without SLUPs, there would have been a better climate for mineral exploration; limited impact on existing mines and on coal industry.	SLUPs have not affected high activity areas; SLUPs have led to delays in accessing M-K oil and gas reserves.	Views are mixed on whether tourism would have developed differently without SLUPs.
Impact of PAs	SLUPs appear to have avoided capturing high capability forestland in PAs. New PAs cover 7% of B.C. land base but only 4.9% of areas with high capability forestlands.	SLUPs protected slightly fewer areas of high mineral potential and slightly more moderate potential metallic areas than overall B.C. average.	PAs have had no impacts on proven oil reserves and limited impact on proven gas reserves. Main impact is on potential gas reserves (high and moderate); $26 million was raised by sale of tenure under some PAs, and other tenures have been	SLUPs targeted regions with high existing tourism uses: new PAs include 10.5% of Existing Use Areas and 12.4% of special features.

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
			grandparented.	
Impact of SMZs	Approximately 25% of high capability forestlands are in SMZs. Over half of interviewees believe that many of the constraints suggested in SLUPs fall within the broad range of FPC. Only in the Kootenays are licensees overwhelmingly concerned about SLUP constraints.	Most companies no longer explore in SMZs, particularly in M-K region. Approximately 23% of the high metallic capability areas covered by SLUPs are in SMZs (and 22% for moderate capability areas), which is about the same proportion of the gross land base in the SLUP regions that is in SMZs, but there are significant regional differences notably because of the M-K region.	SMZs account for 17% of lands with high potential for gas reserves and 8.8% of lands with moderate potential.	SMZs account for 27.5% of existing tourism use areas bringing to 52% percentage in PAs or SMZs.
Impact of ERZs	About 37% of high capability forestland in planned areas is in ERZs. Some regions have over 50% but others like the Kamloops/Okanagan, the Kootenays, and Prince Rupert regions have none. Industry is concerned that the expected benefits of ERZs have not materialized, however, the Chief Forester noted the potential benefits of ERZs in his rationale for Strathcona AAC.	Some 32% of coal tenures are in ERZs (in the Kootenays, over 75% of coal tenures are in ERZs). The mineral capability profile of ERZs is similar to that of the provincial or planned area average, which suggests that high mineral capability lands were not the targets in the creation of ERZs.	Some 45% of oil and gas tenures are in ERZs (and another 58% are in general zones or in agriculture, settlement or private lands.	ERZs account for 10% of existing tourism use areas and 19.5% of special tourism features in planned areas. By comparison, ERZs account for over 20% of the planned area landbase.
Impact on existing operations	Existing operations in the Kootenays and in Coastal B.C. may be affected in the near to medium term. In other regions, SLUPs and the PAS are likely to lead to a drop in LTHL, but the impacts are not likely to be felt for at least 10 years, and in some regions much further into the future.	No or very negligible immediate impact on existing mines. Existing mining jobs could be threatened by SLUPs or PAs due to inability to delineate and mine ore zones, which continue under a PA. Also, SMZs could impact ability for existing mines to pursue additional ore bodies in the vicinity (for example Kemess mine, which is now in an SMZ).	No or very limited impact on proven reserves.	The extent to which new PAs will translate into tourism growth depend on support for commercial activities in parks.

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
Jobs at risk	Setting aside high capability forestlands in new PAs may result in a loss of 2,000 PYs in the primary forest sector and another 1,200 PYs in pulp and paper, value-added and other sectors. The impacts of setting aside almost 1.5 million hectares in no-logging/ wildland zones are not likely to be immediate (most are in the Mackenzie and Cassiar-Stikine and the impacts on the AAC are not expected to be felt for at least 35 years. Approximately 65% of interviewees believe that SMZs will have negative impacts on the LTHL; however, some of the negative impacts from SMZs may be offset by the potential benefits of ERZs.	The industry depends on mineral exploration so that it can identify and develop new mines as well as replace existing mines; industry may lose jobs unless new finds and mines replaced existing operations. The 12 operating metal mines (1999) and Cominco smelter employ 5,400 workers; these jobs may be at risk in the medium and long term if companies fail to identify and develop new mines (in 2001, 3 of the 12 operating mines have closed). For all planned areas, PAs include 10% of lands with high metallic potential and SMZs include another 23%. SEAs identify 7 or 8 deposits that may now be less likely to be developed, and which would provide 1,000 jobs.	SMZs may slow growth in natural gas production and result in 15% fewer FTEs (277 FTEs less than maximum potential) and loss of $60 million in revenues. SLUPs have mainly affected the timing of exploration and oil and gas reserve additions because of delays in completing the pre-tenure planning required in the M-K region.	No or limited impact on existing jobs as most existing operations in PAs are grand-parented. 8 out of 12 believe that restrictions in PAs hindered tourism development.
Impact on investment	Mixed results; half of the interviewees say no impact on investment; one third say SLUPs may lead to decline, three say SLUPs led to an increase in investment. In Kootenays and Coastal B.C., SLUPs are linked to negative changes in AAC and LTHL, which have negatively impacted investment.	On site mineral exploration continues but more speculative exploration has essentially stopped; industry believes obtaining speculative financing has become impossible. B.C. hit more than other provinces.	SLUPs have had little or no impact on the level of investment in developed areas of B.C. which are generally General Zones or ERZs, but have resulted in significant delays in obtaining drilling and permits in M-K region.	Interviewees had mixed views: 2 said reduced conflicts lead to more confidence; 3 said no impact and 4 said SLUPs had negative impacts on tourism sector investment.
Impact on land use certainty	12 out 20 believe that SLUPs led to greater land use certainty. Those who say SLUPs did not increase land use	More than 80% believe that SLUPs reduced land use certainty and decreased likelihood of developing	4 out of 5 believe that SLUPs have led to greater land use certainty; other believes	8 believe impact was positive, 5 that is was neutral and only 2 believe

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
	certainty are in Coastal B.C. and in the Kootenays.	a mine, if found.	SLUPs had no impact.	impact was negative. Positive impact not as significant as expected because plans are too high level to address tourism issues such as VQOs.
Impact on approval process	Results were split. In most regions, SLUPs have had no impact or have quickened the approval process for Forest Development Plans (FDPs) except in zones that require joint approval from MOF and MELP. Interviewees in Kootenays believe that SLUPs have led to delays.	No impact in general zones; but SLUPs hinder mine approval process in SMZs.	SLUPs have led to significant delays in the M-K region but have not impacted the approval process in general and enhanced zones (although SLUPs may have allowed the Business as Usual atmosphere in the high activity regions that are now ERZs).	Expectation that SLUPs will lead to consensus has paralysed development in regions where SLUPs are not completed.
Impact on costs	All except one believe that SLUPs led to harvesting cost increases. Half believe increases are lower than 5%. Some of the increase may be offset through better planning. Of those who believe SLUPs increased costs by more than 5%, most cited SLUP-related reductions in timber volumes as the main culprit.	Some cost increases in exploration sector, but cost impacts pale in comparison to negative impacts on land use certainty,	SLUPs have had no impact on drilling and other costs in General Zones. Costs in SMZs are 10% to 20% higher.	All respondents believe that SLUPs have had no impact on costs other than costs of planning and attending SLUP meetings.
Impact on conflicts	60% believe that SLUPs have succeeded at reducing conflicts between industry and environmentalists. Other 40% are in Kootenays and Coastal B.C. where interviewees believe that environmental groups have not bought into process.	SLUPs have not helped. One third believe that SLUPs have increased conflicts.	4 out of 5 believed that SLUPs have helped reduce conflicts. Two believe that M-K board and permitting process have helped reduce conflicts. SLUPs created a forum to resolve conflicts.	Depends on region; in most regions, SLUPs helped reduce conflict with forest industry. Some say SLUPs are not helpful because plans are regional and most conflicts are very localized. Some mentioned benefits of other initiatives.
Impact on	Most believe that SLUPs increased	Mixed results.	3 believe that SLUPs had a	Most interviewees believe

	Forestry	Mining	Oil and Gas	Tourism/ Recreation
communication	communication between stakeholders, except for First Nations.		positive impact, 2 said no impact.	that SLUPs improved communication between their sector, government agencies and the forest sector.
Impact on resource inventory developed by governments	65% believe that SLUPs led to better inventories; many say that more work is required.	90% believe SLUPs had no impact on resource inventories. Reduced exploration work negatively affects inventories.	No significant change.	10 out of 12 believe that SLUPs have led to better tourism resource inventories.
Comparison with other provinces/ countries		Ontario is viewed as more favourable to mining (exploration expenditures dropped there by 67% from 1987-1990 averages; BC dropped by 79%).	Alberta is much more developed and most areas have year round access. In terrain similar to B.C. foothills, Alberta has same pressures from environmental groups as B.C. NWT/Nunavut have a more cumbersome permitting process than B.C. because of dual government..	Four interviewees chose to comment. All four believe that SLUPs and commercial recreation policy have been positive to backcountry sector. B.C. is at least 10 years ahead of other jurisdictions.

Summary of Study Findings – First Nations, Environment, Agriculture, Community and Other

Key Indicators	First Nations	Environment	Agriculture, Community and Other
Number of interviews	5 Interviews	MELP rep. 4 ENGOs 2 Total 6	Communities 8 LUCO & Other Gov't 5 Beef cattle 2 Total 15
Involvement in SLUPs	All have been involved in SLUPs	All have been involved in SLUPs	Two thirds were involved in SLUPs
Jobs at risk/ Impact on	SLUPs provided immediate opportunities in forestry; also, SLUPs have led to changes in		No or limited impacts on existing agriculture

Key Indicators	First Nations	Environment	Agriculture, Community and Other
economic activity and impact on investment.	economic diversification (tourism, access to a forest license, silviculture contracting, etc.). 3 out of 4 say that SLUPs do not limit community growth whereas one says that they will limit growth. 3 out of 5 say no change on investment.		operations; cattle grazing is grand-fathered in parks but expansion may be compromised. SLUPs give access to Grazing Enhancement Funds. Resource communities affected to the extent that SLUPs impacted resource sectors.
Impact on land use certainty	4 out of 5 believe that SLUPs increased land use certainty and heightened awareness of land use issues.	SLUPs increased land use certainty. SLUP provided more clarity about what resources exist.	11 out of 14 believe that SLUPs increased land use certainty. Other 3 say no impact.
Impact on conflicts/ frequency or intensity of crown land disputes	Most interviewees say that SLUPs have had no impact on conflict between stakeholders; one believes conflicts have decreased. One believes that SLUPs will prejudice treaty negotiations and compound land use conflicts.	4 believe SLUPs decreased conflicts and 2 say no change.	11 out of 12 believe that SLUPs helped decrease conflicts between forest and environment interests. SLUPs also helped resolve conflicts between forest, recreation and tourism.
Impact on communication	SLUPs have led to better communication. First Nations have gained a better understanding of the values and interests of other groups.	SLUPs have led to better communications between environmental groups, government agencies and other stakeholders.	Most believe that SLUPs have led to better communication between stakeholders. Exceptions are interviewees in Kootenays and in regions where SLUPs are not completed.
Impact on resource inventories	4 out of 5 said resource inventories available to First Nations are now better.	Resource inventories are much better (better resource mapping and better access to inventory).	Most believe that SLUPs have led to better resource inventories developed by governments. SLUPs also help prioritize when and what inventories are needed.
Impact on capacity	3 say that SLUPs enhanced First Nations community capacity; 2 said SLUPs helped increase understanding of land use issues, but had not resulted in capacity to do anything about it.	SLUPs have provided better information and increased capacity for governments to manage for environmental values. SLUPs have increased capacity of environmental organizations. Some concern over burnout.	SLUPs have helped enhance capacity in some communities. For example, some communities invested in GIS equipment and capability because of SLUPs. In some regions, too few community representatives took part in SLUPs to really increase community capacity.

Key Indicators	First Nations	Environment	Agriculture, Community and Other
Impact on values	Three interviewees indicated that SLUPs have led to better protection of traditional values that are of interest to First Nations and two said they have not. SLUPs have led to better awareness of First Nations values.	SLUPs led to changes in managing for environmental values. All believe that SLUPs helped reduce negative impacts on wildlife. Some believe that SLUPs also decreased negative impacts on fish, water resources and biodiversity. SLUPs have helped raise the profile and public awareness of environmental objectives. SLUPs have resulted in more collaboration among environmental organizations.	Only 1.5% of the Agriculture Land Reserve is in new PAs and 6.4% is in SMZs. Local community representatives believe they should be included in the SLUPs particularly since together with the First Nations representatives, they are sometimes the only local residents involved in the process. Representatives from the resource sectors, government agencies and environmental groups are not always local residents.

Appendix 1 - Land Use Area and Percentage by Zone by SLUP Region

Total Areas By Zone	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General/ Unclassified	Provincial Total	Total Area (million ha)
Fort Nelson	910,077	0	152,233	2,806,503	0	0	0	3,683,537	2,295,756	9,848,106	9.8
Cassiar-Iskut	458,712	0	911,954	2,057,459	193,897	0	0	0	1,585,939	5,207,961	5.2
Mackenzie	682,980	0	217,358	1,365,277	0	1,122,071	27,811	1,839,750	1,162,097	6,417,344	6.4
Dawson Creek	156,684	0	47,378	381,040	0	0	393,116	655,982	1,313,526	2,947,726	2.9
Fort St. John	204,723	0	2,884	845,073	0	0	557,265	931,568	2,136,767	4,678,280	4.7
Prince George	256,441	2,993	26,006	642,697	84,512	0	391,209	1,225,536	787,843	3,417,237	3.4
Okanagan	122,453	808	70,629	0	0	0	366,922	0	1,887,972	2,448,784	2.4
Vancouver Island	111,242	47,925	281,258	267,597	0	0	797,113	809,052	1,036,620	3,350,807	3.4
Lakes	104,967	27	439,222	304,198	0	0	123,579	0	606,177	1,578,170	1.6
Fort St. James	186,994	118	3,886	520,839	0	0	14,335	1,016,631	1,429,814	3,172,617	3.2
Kamloops	109,316	50	517,510	521,872	0	0	20,180	0	1,598,911	2,767,839	2.8
Bulkley	39,525	125	300	88,064	66,501	0	68,569	0	500,747	763,831	0.8
Kispiox	107,932	0	408	223,593	0	0	34,116	0	858,221	1,224,270	1.2
Kootenay Boundary	535,385	52	612,183	1,281,615	0	0	149,723	70,874	5,579,854	8,229,686	8.2
Robson Valley	71,827	0	222,352	369,314	0	0	69,593	448,231	276,239	1,457,556	1.5
Cariboo-Chilcotin	481,772	232,173	291,194	2,127,330	0	0	1,594	3,643,508	1,597,080	8,374,651	8.4
Vanderhoof	93,574	0	837	54,664	0	0	203,985	782,579	251,694	1,387,333	1.4
TOTAL SLUP AREAS	4,634,604	284,271	3,797,592	13,857,135	344,910	1,122,071	3,219,110	15,107,248	24,905,257	67,272,198	67.3

Percentage of Area	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General/ Unclassified	Provincial Total	SMZs	SMZs- No logging
Fort Nelson	9.24%	0.00%	1.55%	28.50%	0.00%	0.00%	0.00%	37.40%	23.31%	100.00%	28%	0%
Cassiar-Iskut	8.81%	0.00%	17.51%	39.51%	3.72%	0.00%	0.00%	0.00%	30.45%	100.00%	43%	4%
Mackenzie	10.64%	0.00%	3.39%	21.27%	0.00%	17.48%	0.43%	28.67%	18.11%	100.00%	39%	17%
Dawson Creek	5.32%	0.00%	1.61%	12.93%	0.00%	0.00%	13.34%	22.25%	44.56%	100.00%	13%	0%
Fort St. John	4.38%	0.00%	0.06%	18.06%	0.00%	0.00%	11.91%	19.91%	45.67%	100.00%	18%	0%
Prince George	7.50%	0.09%	0.76%	18.81%	2.47%	0.00%	11.45%	35.86%	23.05%	100.00%	21%	2%
Okanagan	5.00%	0.03%	2.88%	0.00%	0.00%	0.00%	14.98%	0.00%	77.10%	100.00%	0%	0%
Vancouver Island	3.32%	1.43%	8.39%	7.99%	0.00%	0.00%	23.79%	24.14%	30.94%	100.00%	8%	0%
Lakes	6.65%	0.00%	27.83%	19.28%	0.00%	0.00%	7.83%	0.00%	38.41%	100.00%	19%	0%
Fort St. James	5.89%	0.00%	0.12%	16.42%	0.00%	0.00%	0.45%	32.04%	45.07%	100.00%	16%	0%
Kamloops	3.95%	0.00%	18.70%	18.85%	0.00%	0.00%	0.73%	0.00%	57.77%	100.00%	19%	0%
Bulkley	5.17%	0.02%	0.04%	11.53%	8.71%	0.00%	8.98%	0.00%	65.56%	100.00%	20%	9%
Kispiox	8.82%	0.00%	0.03%	18.26%	0.00%	0.00%	2.79%	0.00%	70.10%	100.00%	18%	0%
Kootenay Boundary	6.51%	0.00%	7.44%	15.57%	0.00%	0.00%	1.82%	0.86%	67.80%	100.00%	16%	0%
Robson Valley	4.93%	0.00%	15.26%	25.34%	0.00%	0.00%	4.77%	30.75%	18.95%	100.00%	25%	0%
Cariboo-Chilcotin	5.75%	2.77%	3.48%	25.40%	0.00%	0.00%	0.02%	43.51%	19.07%	100.00%	25%	0%
Vanderhoof	6.74%	0.00%	0.06%	3.94%	0.00%	0.00%	14.70%	56.41%	18.14%	100.00%	4%	0%
TOTAL SLUP AREAS	6.89%	0.42%	5.65%	20.60%	0.51%	1.67%	4.79%	22.46%	37.02%	100.00%	22.8%	2%

Notes:

The total area for each region sometimes varies slightly from one table to the next but the differences are inconsequential.

The Lower Mainland is not included in the above totals.

Source: Based on LUCO data (derived from mineral capability tables - metallic).

Prepared by Pierce Lefebvre Consulting based on LUCO Data

Appendix 2 - AAC Changes for B.C. Crown Lands Over the Past Decade
2.1: All Species for Each TSA and TFL

	TSR-1 1992 - 1996				TSR-2 1997 -				
	Pre TSR-1	TSR-1	Change	Percentage Change	TSR-2	Change	Percentage Change	Other Change*	Current AAC TSR-1 or TSR-2
Vancouver Forest Region									
Fraser TSA	1,765,000	1,550,000	-215,000	-12.2%	1,270,000	-280,000	-18.1%		1,270,000
Soo TSA	580,000	506,000	-74,000	-12.8%	503,000	-3,000	-0.6%		503,000
Sunshine Coast TSA	1,100,000	1,140,000	40,000	3.6%					1,140,000
QCI TSA	509,861	475,000	-34,861	-6.8%				361,000	475,000
Mid Coast TSA	1,000,000	1,000,000			998,000	-2,000	-0.2%		998,000
Kingcome TSA	1,798,270	1,399,000	-399,270	-22.2%					1,399,000
Strathcona TSA	1,693,745	1,420,000	-273,745	-16.2%	1,278,000	-142,000	-10.0%		1,278,000
Arrowsmith TSA	468,500	400,000	-68,500	-14.6%					400,000
TFL 24	115,000	115,000							115,000
TFL 37	1,024,816	1,068,000	43,184	4.2%	1,068,000				1,068,000
TFL 38	263,000	263,000			250,500	-12,500	-4.8%		250,500
TFL 43	49,660	44,460	-5,200	-10.5%	39,900	-4,560	-10.3%		39,900
TFL 44	2,680,000	2,228,000	-452,000	-16.9%	1,890,000	-338,000	-15.2%	1,766,200	1,890,000
TFL 6	1,300,000	1,288,000	-12,000	-0.9%	1,490,000	202,000	15.7%		1,490,000
TFL 10	170,950	170,950							170,950
TFL 19	978,000	978,000							978,000
TFL 25	783,000	779,000	-4,000	-0.5%				692,000	779,000
TFL 26	41,200	45,000	3,800	9.2%					45,000
TFL 39	3,675,000	3,740,000	65,000	1.8%					3,740,000
TFL 45	210,000	220,000	10,000	4.8%					220,000
TFL 46	558,860	535,000	-23,860	-4.3%					535,000
TFL 47	711,000	865,000	154,000	21.7%					865,000
TFL 54	138,000	75,750	-62,250	-45.1%	75,750				75,750
TFL 57								123,800	
Total	21,613,862	20,305,160	-1,308,702	-6.1%	8,863,150	-580,060	-2.9%	2,943,000	19,725,100
Nelson Forest Region									
Arrow TSA	619,000	619,000			550,000	-69,000	-11.1%		550,000
Boundary TSA	700,000	700,000							700,000
Cranbrook TSA	900,947	850,000	-50,947	-5.7%	871,000	21,000	2.5%		871,000
Golden TSA	650,000	540,000	-110,000	-16.9%	530,000	-10,000	-1.9%		530,000
Invermere TSA	657,264	591,500	-65,764	-10.0%					591,500
Kootenay TSA	900,000	700,000	-200,000	-22.2%					700,000
Revelstoke TSA	269,000	230,000	-39,000	-14.5%	230,000				230,000
TFL 3	108,000	65,000	-43,000	-39.8%	80,000	15,000	23.1%		80,000
TFL 8	145,000	145,000			145,000				145,000
TFL 23	700,000	680,000	-20,000	-2.9%	680,000				680,000
TFL 14	178,926	164,000	-14,926	-8.3%					164,000
TFL 55	110,000	100,000	-10,000	-9.1%					100,000
TFL 56	110,000	100,000	-10,000	-9.1%					100,000
Total	6,048,137	5,484,500	-563,637	-9.3%	3,086,000	-43,000	-0.8%		5,441,500

Appendix 2 - AAC Changes for B.C. Crown Lands Over the Past Decade
2.1: All Species for Each TSA and TFL

	TSR-1 1992 - 1996				TSR-2 1997 -				
	Pre TSR-1	TSR-1	Change	Percentage Change	TSR-2	Change	Percentage Change	Other Change*	Current AAC TSR-1 or TSR-2
Kamloops Forest Region									
Kamloops TSA	2,393,180	2,679,180	286,000	12.0%					2,679,180
Okanagan TSA	2,615,000	2,615,000							2,615,000
Merritt TSA	1,254,750	1,454,250	199,500	15.9%				2,004,250	1,454,250
Lillooet TSA	643,500	643,500							643,500
TFL 15	72,000	78,000	6,000	8.3%	70,000	-8,000	-10.3%		70,000
TFL 18	187,000	187,000			177,650	-9,350	-5.0%		177,650
TFL 49	380,000	380,000			380,000				380,000
TFL 33	27,500	22,500	-5,000	-18.2%	21,000	-1,500	-6.7%		21,000
TFL 35	125,600	125,600							125,600
Total	7,698,530	8,185,030	486,500	6.3%	648,650	-18,850	-0.2%	2,004,250	8,166,180
Cariboo Forest Region									
100 Mile TSA	1,250,000	1,362,000	112,000	9.0%					1,362,000
Quesnel TSA	2,350,000	2,340,000	-10,000	-0.4%					2,340,000
Williams Lake TSA	3,975,000	3,807,000	-168,000	-4.2%					3,807,000
TFL 5	110,000	110,000			122,800	12,800	11.6%		122,800
TFL 52	518,952	549,000	30,048	5.8%					549,000
Total	8,203,952	8,168,000	-35,952	-0.4%	122,800	12,800	0.2%		8,180,800
Prince Rupert Forest Region									
Bulkley TSA	895,000	895,000							895,000
Cassiar TSA	140,000	400,000	260,000	185.7%					400,000
Cranberry TSA	110,000	110,000			110,000				110,000
Kalum TSA	480,000	464,000	-16,000	-3.3%	459,684	-4,316	-0.9%	436,884	459,684
Kispiox TSA	1,092,611	1,092,611							1,092,611
Lakes TSA	1,485,400	1,500,000	14,600	1.0%					1,500,000
Morice TSA	1,985,815	1,985,815							1,985,815
Nass TSA	1,250,000	1,150,000	-100,000	-8.0%				1,142,400	1,150,000
North Coast TSA	600,000	600,000			573,624	-26,376	-4.4%		573,624
TFL 1	720,000	720,000			720,000			611,000	720,000
TFL 41	430,000	400,000	-30,000	-7.0%	400,000				400,000
Total	9,188,826	9,317,426	128,600	1.4%	2,263,308	-30,692	-0.3%	2,190,284	9,286,734
Prince George Forest Region									
Dawson Cr. TSA	1,841,864	1,733,033	-108,831	-5.9%					1,733,033
Fort Nelson TSA	972,000	1,500,000	528,000	54.3%					1,500,000
Fort St. John TSA	1,803,066	2,015,000	211,934	11.8%					2,015,000
Mackenzie TSA	2,947,363	2,997,363	50,000	1.7%					2,997,363
Prince George TSA	9,073,661	9,363,661	290,000	3.2%					9,363,661
Robson Valley TSA	592,754	602,377	9,623	1.6%					602,377
TFL 53	187,630	204,700	17,070	9.1%	239,500	34,800	17.0%		239,500
TFL 30	407,000	350,000	-57,000	-14.0%					350,000
TFL 42	132,300	120,000	-12,300	-9.3%					120,000
TFL 48	410,000	514,000	104,000	25.4%					514,000
Total	18,367,638	19,400,134	1,032,496	5.6%	239,500	34,800	0.2%		19,434,934
Grand Total	71,120,945	70,860,250	-260,695	-0.4%	15,223,408	-625,002	-0.9%	7,137,534	70,235,248

*Other change refers to increases or decreases for infestations or land base changes, ie Nisga'a Treaty

Source: Ministry of Forests (Sinclair Tedder); Feb. 2001

Appendix 2 - AAC Changes for B.C. Crown Lands Over the Past Decade
2.2: 1992 to 1996 TSR-1 Results (TSAs and TFLs)

Region		AAC m3	Conventional m3	Deciduous m3	Insect/Disease m3	Marginal m3
Vancouver	pre-TSR	21,674,046	21,269,359	138,687	0	266,000
	post-TSR	20,300,160	19,301,700	289,260	0	709,200
	change	-6.3%	-9.3%	108.6%		166.6%
Prince Rupert	pre-TSR	9,188,826	9,188,826	0	0	0
	post-TSR	9,317,426	8,560,426	20,000	0	737,000
	change	1.4%	-6.8%			
Prince George	pre-TSR	18,367,638	16,235,307	2,132,331	0	0
	post-TSR	19,400,134	16,194,534	2,811,500	290,000	104,100
	change	5.6%	-0.3%	31.9%		
Nelson	pre-TSR	6,048,137	6,048,137	0	0	0
	post-TSR	5,484,500	5,339,500	0	0	145,000
	change	-9.3%	-11.7%			
Kamloops	pre-TSR	7,698,530	7,698,530	0	0	0
	post-TSR	8,185,030	7,643,030	0	0	542,000
	change	6.3%	-0.7%			
Cariboo	pre-TSR	8,203,952	6,378,952	75,000	850,000	900,000
	post-TSR	8,168,000	6,309,000	40,000	850,000	969,000
	change	-0.4%	-1.1%	-46.7%	0.0%	7.7%
B.C. Total	pre-TSR	71,181,129	66,819,111	2,346,018	850,000	1,166,000
	post-TSR	70,855,250	63,348,190	3,160,760	1,140,000	3,206,300
	change	-0.5%	-5.2%	34.7%	34.1%	175.0%

Source: B.C. Ministry of Forests; Jan. 28, 1997

Appendix 3 - Forest Indicators

3.1 Forest Land Capability

AREA as reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agricultural/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Province	% in New Protected and No Logging SMZs	% in SMZs with Logging Permitted
PROVINCIAL TOTAL	4,641,715	1,946,617	9,264,664	14,066,441	344,908	1,122,069	3,210,984	15,107,209	23,017,369	1,987,956	24,102,689	94,742,611			
Productive Forest	2,446,584	220,109	1,044,718	7,089,975	124,342	251,691	1,589,215	11,595,504	14,652,486	1,401,233	8,879,955	49,296,812	52%		
Forest Land Capability															
Provincial Totals															
HIGH	1,297,851	105,112	384,618	3,539,085	76,468	39,725	1,400,632	9,578,754	9,426,495	754,128	4,679,260	31,282,128	33%	4.52%	11.31%
MODERATE	1,075,829	93,637	459,512	2,833,908	44,812	198,411	116,066	1,913,328	4,909,394	639,778	3,080,218	15,364,893	16%	8.58%	18.44%
LOW/NO	72,904	21,360	200,588	716,982	3,062	13,555	72,517	103,422	316,597	7,327	1,120,477	2,648,791	3%	3.38%	27.07%
	2,446,584	220,109	1,044,718	7,089,975	124,342	251,691	1,589,215	11,595,504	14,652,486	1,401,233	8,879,955	49,295,812		5.73%	14.36%
LRMP Totals															
Fort Nelson												9,848,107			
HIGH	183,425		2,870	691,435				1,867,864	1,512,708			4,258,302		3.84%	18.24%
MODERATE	127,987		25,424	517,476				8,026	177,568			856,481		14.94%	60.42%
LOW/NO	2,636		49	22,447					5,932			31,064		8.49%	72.26%
	314,048		28,343	1,231,358				1,875,890	1,696,208			5,145,847		5.71%	23.83%
Cassiar-Iskut												5,207,986			
HIGH	136,791		83,012	268,293	71,748				106,802			666,646		31.28%	40.25%
MODERATE	118,713		108,536	201,958	5,489				134,845			569,541		21.81%	35.46%
LOW/NO	788		683	2,600	23				567			4,661		17.40%	55.78%
	256,292		192,231	472,851	77,260				242,214			1,240,848		26.88%	38.11%
Mackenzie												6,417,349			
HIGH	193,006		2,196	211,667		39,725	18,611	706,128	199,596			1,370,929		16.66%	15.44%
MODERATE	12,228		30,347	372,114		198,412	2,191	665,133	428,951			1,709,376		12.32%	21.77%
LOW/NO	135,510		242	34,027		13,554	1	81,099	55,286			319,719		46.62%	10.64%
	340,744		32,785	617,808		251,691	20,803	1,452,360	683,833			3,400,024		17.42%	18.17%
Dawson Creek												2,968,637			
HIGH	52,085		11,082	174,398			176,243	496,905	584,839			1,495,552		3.48%	11.66%
MODERATE	50,864		12,755	107,831			450	112,217	462,053			746,170		8.82%	14.45%
LOW/NO	2,587			7,356				164	8,170			18,277		14.06%	40.29%
	105,526		23,837	289,585			176,693	609,286	1,055,062			2,259,989		4.67%	12.81%
Fort St John												4,678,278			
HIGH	15,855		611	263,848			287,936	750,998	977,454			2,296,702		0.69%	11.49%
MODERATE	53,275		92	184,190				6,031	36,650			280,238		19.01%	66.73%
LOW/NO	5,200		39	10,692					310			16,241		32.02%	65.83%
	74,330		742	458,730			287,936	757,029	1,014,414			2,593,181		2.87%	17.69%
Prince George												3,417,229			
HIGH	63,018	2,604	17,884	14,885	4,044		300,118	965,062	607,805			1,975,620		3.39%	0.75%
MODERATE	60,957		112	279,776	20,651			48,003	105,318			514,817		15.89%	54.34%
LOW/NO	5,756			6,783	1,360			31	640			14,570		48.18%	45.93%
	129,730	2,604	17,996	301,444	26,055		300,118	1,013,096	714,063			2,505,106		6.22%	12.03%
Okanagan												2,448,721			
HIGH	31,036	586	16,862				127,080			754,128		929,692		3.34%	
MODERATE	39,056		21,556				35,436			639,778		735,826		5.31%	
LOW/NO	2,353		818				3,701			7,327		14,199		16.46%	
	72,447	586	39,136				166,227			1,401,233		1,679,629		4.31%	
Vancouver Island												3,350,807			
HIGH	32,329	22,072	31,885	105,067			144,200	434,419	525,810			1,295,782		2.49%	8.11%
MODERATE	54,469	17,642	111,732	108,996			115,302	254,693	332,594			995,428		5.47%	10.95%
LOW/NO	2		1,297	94			8	641	1,076			3,118		0.06%	3.01%
	86,800	39,714	144,914	214,157			259,510	689,753	859,480			2,294,328		3.76%	9.33%
Lakes												1,576,119			
HIGH	88,719		4,879	166,559			94,098		527,160			881,415		10.04%	19.08%
MODERATE	1,641		1,590	18,804					57,959			79,994		2.05%	23.51%
LOW/NO	77		1	639					698			1,415		5.44%	45.16%
	90,437		6,470	186,002			94,098		585,817			964,824		9.37%	19.49%
Fort St James												3,172,626			
HIGH	85,381	96	865	131,356			10,041	826,607	365,013			1,419,359		6.02%	9.25%
MODERATE	50,725		1	96,187				100,775	512,490			760,178		6.67%	12.65%
LOW/NO	2,990			3,038				1,475	42,110			49,613		5.95%	6.13%
	139,096	96	866	230,581			10,041	928,857	919,613			2,229,150		6.24%	10.34%
Kamloops												2,767,821			
HIGH	42,302		24,372	113,725			1,716		803,256			985,371		4.29%	11.54%
MODERATE	31,824		10,353	198,962			2,256		437,541			680,936		4.67%	29.22%
LOW/NO	1,974		146	12,292			1,545		14,509			30,466		6.48%	40.35%
	76,100		34,871	324,979			5,517		1,255,306			1,696,773		4.48%	19.15%
Bulkley												763,828			
HIGH	9,706	121	270	32,476	676		39,014		246,620			328,883		3.18%	9.87%
MODERATE	9,867			27,142	18,672				173,613			229,294		12.48%	11.84%
LOW/NO	815			1,155	1,679				4,715			8,364		29.82%	13.81%
	20,388	121	270	60,773	21,027		39,014		424,948			566,541		7.31%	10.73%

3.1. Forest Land Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wetland	Agricultural Settlement/Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Province	% in New Protected and No Logging SMZs	%in SMZs with Logging Permitted
Kispiox												1,224,254			
HIGH	49,578	370		29,825			25,439		419,904			525,116		9.44%	5.68%
MODERATE	18,088			45,743					229,188			293,019		6.17%	15.61%
LOW/NO	310			3,609					6,678			10,597		2.93%	34.06%
	67,976	370		79,177			25,439		655,770			828,732		8.20%	9.55%
Kootenay Boundary												8,229,687			
HIGH	72,369	1	19,353	278,332			5,320	374	1,335,158			1,710,907		4.23%	16.27%
MODERATE	119,849		26,522	311,342			22,854	40,126	1,454,707			1,975,400		6.07%	15.76%
LOW/NO	19,202		5,125	36,086			152	896	107,530			168,991		11.36%	21.35%
	211,420	1	51,000	625,760			28,326	41,396	2,897,395			3,855,298		5.48%	16.23%
Robson Valley												1,457,554			
HIGH	17,954		11,191	81,376			50,646	48,908	12,155			222,230		8.08%	38.82%
MODERATE	17,342		50,313	102,128			27	108,155	101,371			379,336		4.57%	26.92%
LOW/NO	1,293		9,697	13,508				18,043	7,005			49,546		2.61%	27.26%
	36,589		71,201	197,012			50,673	175,106	120,531			651,112		5.62%	30.28%
Cariboo-Chilcotin												8,367,075			
HIGH	135,497	15,559	32,703	700,500			446	2,832,727	1,017,453			4,734,885		2.86%	14.78%
MODERATE	142,364	38,120	32,022	711,807				465,376	224,895			1,614,584		8.82%	44.08%
LOW/NO	12,907	1,312	31,316	55,119			25	1,073	61,171			162,923		7.92%	33.83%
	290,768	54,991	96,041	1,467,426			471	3,299,176	1,303,519			6,512,392		4.46%	22.53%
Lower Mainland												4,684,000			
HIGH		7,255	23,450	124,032								154,737			80.16%
MODERATE		1,780	3,244	20,496								25,520			80.31%
LOW/NO		3	41	4,201								4,245			98.96%
		9,038	26,735	148,729								184,502			80.61%
Vanderhoof												1,387,328			
HIGH	75,007		766	44,927			124,347	628,762	184,662			1,058,471		7.08%	4.24%
MODERATE	8,386			2,674				104,793	39,651			155,504		5.39%	1.72%
LOW/NO															
	83,393		766	47,601			124,347	733,555	224,313			1,213,975		6.87%	3.92%
Total Planned Area (w/o LM)												67,305,386			
Total High (planned w/o LM)	1,264,080	41,409	280,601	3,310,669	78,468	39,725	1,405,285	9,578,754	9,428,495	754,128		26,157,594	38.86%	5.44%	12.66%
Total Moderate (planned w/o LM)	917,635	55,762	431,355	3,287,130	44,612	198,412	178,518	1,913,328	4,909,394	639,778		12,576,124	18.69%	9.67%	26.14%
Total Low (planned w/o LM)	194,339	1,312	49,513	209,445	3,082	13,554	5,432	193,422	316,597	7,327		904,003	1.34%	23.48%	23.17%
Total Productive (planned w/o LM)	2,376,054	98,483	741,469	6,807,244	124,342	251,691	1,589,215	11,585,504	14,652,486	1,401,233		39,637,721	58.89%	7.19%	17.17%
Total Productive (province)	2,446,584	220,109	1,044,718	7,089,975	124,342	251,691	1,589,215	11,585,504	14,652,486	1,401,233	8,879,955	49,295,812			
% High Capability	28%	5%	7%												
% Moderate Capability	23%	5%	9%												
% Low Capability	2%	1%	4%												
% Productive	53%	11%	20%												

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wetland	Agricultural Settlement/Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Province	% in New Protected and No Logging SMZs	%in SMZs with Logging Permitted
Vancouver Island (Old Data)												3,349,011			
HIGH	15,777	800	32,719	33,784			33,353	151,127	278,067			545,627		2.69%	8.19%
MODERATE	42,747	2,823	53,073	50,927			4,660	84,949	138,302			377,481		11.32%	13.48%
LOW/NO			218	35				16	323			592			5.91%
	58,524	3,623	86,010	84,746			38,013	236,092	416,692			923,700		6.34%	8.17%

Appendix 3 Forest Indicators
3.2: Mature Forest Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	Total by Region
PROVINCIAL TOTAL	4,641,715	1,946,617	5,284,664	14,068,441	344,908	1,122,069	3,218,984	15,107,289	23,017,369	1,887,956	24,102,599	94,742,611	
Productive Forest	2,446,584	220,109	1,044,718	7,089,975	124,342	251,691	1,589,215	11,595,504	14,652,486	1,401,233	8,879,955	49,295,812	
Mature Productive Forest	1,605,212	215,535	832,937	4,377,501	107,584	171,438	479,641	5,630,984	7,809,411	733,442	6,107,691	28,071,376	
Mature Forest Land Capability													
HIGH	781,346	103,910	255,423	1,874,711	64,897	17,648	449,769	4,267,640	4,427,632	339,639	2,395,526	14,978,141	
MODERATE	770,823	93,172	408,317	2,349,252	40,180	144,811	27,571	1,281,702	3,161,973	388,099	2,785,675	11,451,575	
LOW/NO	53,043	18,453	169,197	153,538	2,507	8,979	2,301	81,642	219,806	5,704	926,490	1,641,660	
	1,605,212	*215,535*	*832,937*	*4,377,501*	*107,584*	*171,438*	*479,641*	*5,630,984*	*7,809,411*	*733,442*	*6,107,691*	*28,071,376*	
Fort Nelson													
HIGH	*72,136*	*0*	*1,836*	*316,393*				*404,551*	*765,161*			*1,560,077*	
MODERATE	*65,650*	*0*	*17,553*	*309,630*				*3,440*	*72,867*			*469,140*	2,046,983
LOW/NO	*1,928*	*0*	*36*	*14,693*				*0*	*1,109*			*17,766*	
Cassiar-Iskut													
HIGH	*109,470*	*0*	*53,195*	*182,874*	*60,893*				*49,848*			*456,280*	
MODERATE	*101,972*	*0*	*98,425*	*173,072*	*5,244*				*106,350*			*485,063*	944,944
LOW/NO	*604*	*0*	*674*	*1,872*	*23*				*428*			*3,601*	
Mackenzie													
HIGH	*115,736*	*0*	*1,406*	*138,453*	*0*	*17,648*	*13,351*	*360,660*	*121,151*			*768,405*	
MODERATE	*87,618*	*0*	*24,912*	*276,285*	*0*	*144,811*	*1,797*	*490,430*	*306,569*			*1,332,422*	2,251,365
LOW/NO	*9,297*	*0*	*174*	*25,192*	*0*	*8,979*	*1*	*65,307*	*41,588*			*150,538*	
Dawson Creek													
HIGH	*28,866*	*0*	*5,846*	*79,459*			*56,550*	*223,866*	*310,710*			*705,297*	
MODERATE	*39,236*	*0*	*8,034*	*79,290*			*390*	*70,460*	*319,041*			*516,451*	1,233,682
LOW/NO	*1,761*	*0*	*0*	*4,617*			*0*	*116*	*5,440*			*11,934*	
Fort St John													
HIGH	*6,020*	*0*	*98*	*101,184*			*58,413*	*312,148*	*282,058*			*759,921*	
MODERATE	*41,451*	*0*	*88*	*134,345*			*0*	*4,938*	*27,209*			*208,031*	981,749
LOW/NO	*4,333*	*0*	*39*	*9,212*			*0*	*0*	*213*			*13,797*	
Prince George													
HIGH	*44,204*	*1,562*	*10,686*	*84,598*	*3,388*		*122,163*	*435,980*	*345,640*			*1,048,221*	
MODERATE	*51,207*	*0*	*110*	*241,238*	*18,674*		*0*	*32,048*	*81,697*			*424,974*	1,484,582
LOW/NO	*4,192*	*0*	*0*	*5,663*	*1,106*		*0*	*6*	*420*			*11,387*	
Okanagan													
HIGH	*14,628*	*294*	*10,363*				*35,432*			*339,639*		*400,356*	
MODERATE	*25,067*	*0*	*13,730*				*10,991*			*388,099*		*437,887*	847,783
LOW/NO	*1,734*	*0*	*648*				*1,454*			*5,704*		*9,540*	
Vancouver Island													
HIGH	*26,177*	*21,505*	*25,016*	*66,668*			*9,904*	*169,772*	*189,626*			*508,668*	
MODERATE	*50,807*	*17,044*	*98,676*	*85,954*			*33,322*	*168,780*	*220,763*			*675,346*	1,185,916
LOW/NO	*0*	*0*	*818*	*34*			*6*	*417*	*627*			*1,902*	
Lakes													
HIGH	*66,447*	*0*	*3,927*	*107,890*			*40,995*		*309,585*			*528,844*	
MODERATE	*1,577*	*0*	*984*	*17,263*			*0*		*41,842*			*61,666*	591,654
LOW/NO	*72*	*0*	*1*	*385*			*0*		*686*			*1,144*	

Appendix 3 Forest Indicators

3.2: Mature Forest Capability

AREA is reported in hectares		New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	Total by Region
Fot St James														
	HIGH	66,676	71	260	88,992			5,961	523,769	278,048			963,777	
	MODERATE	40,716	0	1	81,416			0	68,677	426,941			617,751	1,622,281
	LOW/NO	2,195	0	0	2,529			0	1,193	34,836			40,753	
Kamloops														
	HIGH	25,235	0	15,131	59,012			577		376,334			476,289	
	MODERATE	26,130	0	8,462	120,508			614		271,963			427,677	923,525
	LOW/NO	1,468	0	138	8,659			735		8,559			19,559	
Bulkley														
	HIGH	7,662	114	176	24,352	616		14,738		152,780			200,438	
	MODERATE	9,133	0	0	24,162	16,262		0		142,976			192,533	399,803
	LOW/NO	673	0	0	918	1,378		0		3,863			6,832	
Kispiox														
	HIGH	38,545	0	91	23,375			15,989		302,356			380,356	
	MODERATE	16,476	0	0	42,514			0		214,011			273,001	662,634
	LOW/NO	277	0	0	3,246			0		5,754			9,277	
Kootenay Boundary														
	HIGH	25,487	0	8,305	77,925			882	103	340,882			453,584	
	MODERATE	62,472	0	18,757	138,082			8,339	10,487	597,296			835,433	1,395,997
	LOW/NO	12,490	0	3,914	22,694			100	406	67,376			106,980	
Robson Valley														
	HIGH	12,679		5,675	50,356			30,045	30,658	10,517			139,930	
	MODERATE	14,804		39,052	73,883			12	79,377	86,177			293,305	470,740
	LOW/NO	932		7,804	9,917			0	13,448	5,404			37,505	
Cariboo-Chilcotin														
	HIGH	88,558	3,182	26,212	398,542			74	1,431,107	583,790			2,531,465	
	MODERATE	113,050	5,262	30,400	516,478			0	276,193	138,520			1,079,903	3,737,044
	LOW/NO	10,299	26	30,280	40,808			11	749	43,503			125,676	
Lower Mainland														**PAs Approved**
	HIGH	0	27,085	13,872	62,079									321,887
	MODERATE	0	17,278	5,554	10,592									170,786
	LOW/NO	0	744	481	3,099									16,288
Vanderhoof														
	HIGH	48,390	0	565	35,214			52,759	375,026	87,278			599,232	
	MODERATE	7,302	0	0	1,885			0	76,872	29,619			115,678	714,910
	LOW/NO	0	0	0	0			0	0	0			0	
TOTALS		**1,603,839**	**94,167**	**592,405**	**4,377,501**	**107,584**	**171,438**	**515,605**	**5,630,984**	**7,809,411**	**733,442**	**0**	**21,495,592**	**40,841,557**
Total High		796,916	53,813	182,660	1,897,366	64,897	17,648	457,833	4,267,640	4,505,764	339,639		12,584,176	
Total Moderate		754,668	39,584	364,738	2,326,597	40,180	144,811	55,465	1,281,702	3,083,841	388,099		8,479,685	
Total Low/No		52,255	770	45,007	153,538	2,507	8,979	2,307	81,642	219,806	5,704		572,515	
Total Planned Areas w/o LM														
High		796,916	26,728	168,788	1,835,287	64,897	17,648	457,833	4,267,640	4,505,764	339,639	0	12,481,140	
Moderate		754,668	22,306	359,184	2,316,005	40,180	144,811	55,465	1,281,702	3,083,841	388,099	0	8,446,261	
Low/No		52,255	26	44,526	150,439	2,507	8,979	2,307	81,642	219,806	5,704	0	568,191	
Total w/o Lower Mainland		**1,603,839**	**49,060**	**572,498**	**4,301,731**	**107,584**	**171,438**	**515,605**	**5,630,984**	**7,809,411**	**733,442**	**0**	**21,495,592**	

Appendix 3 Forest Indicators
3.2: Mature Forest Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	Total by Region
Vancouver Island (Old data)													
HIGH	10,824	792	16,115	22,680			3,712	70,959	85,333			210,415	
MODERATE	41,234	2,759	54,845	42,065			3,556	62,086	107,030			313,575	524,360
LOW/NO	0	0	77	31			0	12	250			370	
	52,058	3,551	71,037										
Vancouver Island (New Data)													
HIGH	26,177	21,505	25,016	66,668			9,904	169,772	189,626			508,668	
MODERATE	50,807	17,044	98,676	85,954			33,322	168,780	220,763			675,346	1,185,916
LOW/NO	0	0	818	34			6	417	627			1,902	
	76,984	38,549	124,510										

Appendix 3 - Forest Indicators
3.3: Methodology for Deriving Forest Capability Indicators

The criteria for biogeoclimatic "Capability" classification is as follows:

	Biogeoclimatic zones			
CAPABILITY	*BC INTERIOR*	*Vancouver Island/ Lower Mainland*	*North Coast/Central Coast*	*Queen Charlotte Islands*
HIGH	*CDF* *CWH* *IDF* *ICH* *SBPS* *BWBPS*	*CDF* *CWH xm1, xm2, dm,ds1* *CWH vm,vm2*	*CWH ds2, dm,mm1,xm2*	*CWH wh1,wh2*
MODERATE	MH ESSF SWB PP MS	CWH vm1, mm1, ESSF mw CWH ms1	CWH vh2,vm1,ws2 MH wh1	CWH vh2 MH wh1, wh2
LOW or NO	AT BG	CWH vh1, vh2 MH AT IDF ESSF dc2	AT CWHds2,vh1,vm2 ESSFmc,mk,mw,xv,mw IDF ww , MS, SBPS MHmm1,mm2,mm2e,mc2	AT

Methodology for deriving Capability for Productive Forest:

Extracted Productive Forest Layer from MoF Mapgen files (npd-label = 1).

Overlayed resulting file with Biogeoclimative zones.

Assigned capability of High, Moderate or Low based on the above table.

Note: This method did not capture several TFLs, which have been excluded from the analysis as shown on the map.

Methodology for deriving Capability for Mature Productive Forest:

Extracted the Mature Forest layer from MOFs Mapgen Files (pti-label = 2).

Overlayed with result of Productive Forest Capability (from above).

Notes: This method did not capture several TFLs, which have been excluded from the analysis as shown on the map.

For Vancouver Island, Old Growth forests as defined by the Baseline Thematic Mapping for the province was used rather than the Mature Forest layer, which was not available.

Source: Land Use Coordination Office.

Appendix 4 - Mining Indicators

4.1: Provincial Summary of Mineral Capability, Tenures and Occurrences

AREA is reported in hectares	**New SLUP Protected**	**New Non SLUP Protected**	**Original Protected**	**Sub-Total PAs**	**SMZs**	**Agriculture/ Settlement/ Private**	**Enhanced**	**General/ Unclassified**	**Not Yet Planned**	**Provincial Total**
PROVINCIAL TOTAL	4,653,559	1,918,328	5,284,664	11,856,551	15,535,418	3,218,984	15,107,289	24,905,325	24,102,599	94,726,166
% of Total Area	4.91%	2.03%	5.58%	12.52%	16.40%	3.40%	15.95%	26.29%	25.44%	100.00%
MINERAL CAPABILITY:										
PROVINCIAL TOTAL										
Metallic										
HIGH	3.7%	3.0%	4.0%	10.8%	15.5%	3.7%	13.1%	27.3%	29.6%	100.0%
MODERATE	4.6%	2.7%	6.5%	13.8%	14.7%	2.9%	15.5%	25.2%	27.9%	100.0%
LOW/NO	5.8%	1.0%	5.8%	12.5%	18.0%	3.6%	17.7%	26.4%	21.7%	100.0%
Industrial										
HIGH	4.5%	2.8%	6.3%	13.6%	15.1%	3.1%	11.2%	31.8%	25.3%	100.0%
MODERATE	6.5%	2.2%	4.8%	13.4%	21.1%	2.6%	12.7%	24.6%	25.6%	100.0%
LOW/NO	4.0%	1.6%	5.8%	11.4%	13.8%	4.1%	20.5%	24.8%	25.4%	100.0%
TOTAL SLUPS EXCLUDING LOWER MAINLAND										
TOTAL AREA	4,634,604	284,271	3,797,592	8,716,467	15,324,116	3,219,110	15,107,248	24,905,257	0	67,272,198
% of Total Area	6.9%	0.4%	5.6%	13.0%	22.8%	4.8%	22.5%	37.0%	0.0%	100.0%
Metallic										
HIGH	5.6%	1.2%	3.4%	10.2%	22.7%	5.7%	19.9%	41.5%	0.0%	100.0%
MODERATE	6.8%	0.5%	5.8%	13.1%	21.6%	4.3%	23.2%	37.8%	0.0%	100.0%
LOW/NO	7.5%	0.0%	6.6%	14.1%	23.5%	4.7%	23.2%	34.6%	0.0%	100.0%
Industrial										
HIGH	6.3%	0.2%	7.3%	13.8%	21.2%	4.4%	15.7%	44.8%	0.0%	100.0%
MODERATE	9.1%	0.8%	4.5%	14.5%	29.1%	3.7%	17.9%	34.8%	0.0%	100.0%
LOW/NO	5.6%	0.2%	5.6%	11.5%	19.2%	5.7%	28.8%	34.8%	0.0%	100.0%
TENURES (as at January 31, 2001):										
PROVINCIAL TOTAL										
Mineral Tenures	1.0%	0.8%	0.3%	2.1%	23.8%	1.7%	13.3%	33.1%	26.1%	100.0%
Coal Tenures	0.3%	0.0%	0.1%	0.3%	11.5%	10.2%	31.6%	44.0%	2.3%	100.0%
Placer Tenures	0.5%	0.2%	0.0%	0.8%	26.1%	2.2%	26.2%	14.4%	30.3%	100.0%
TOTAL SLUPS EXCLUDING LOWER MAINLAND										
Mineral	1.4%	0.0%	0.2%	1.6%	31.8%	2.3%	18.5%	45.8%		100.0%
Coal	0.3%	0.0%	0.1%	0.3%	11.7%	10.5%	32.4%	45.1%		100.0%
Placer	0.8%	0.0%	0.0%	0.8%	36.9%	3.2%	38.2%	20.9%		100.0%
MINERAL OCCURRENCES (INCLUDES COAL, METALLIC AND INDUSTRIAL)										
PROVINCIAL TOTAL										
% Mineral Occurrences	2.8%	1.3%	2.6%	6.7%	17.8%	5.4%	6.9%	33.2%	30.0%	100.0%
TOTAL SLUPS EXCLUDING LOWER MAINLAND										
% Mineral Occurrences	4.1%	0.3%	2.3%	6.7%	25.9%	8.0%	10.2%	49.3%	0.0%	100.0%

Note: SLUP areas exclude the Lower Mainland.

Prepared by Pierce Lefebvre Consulting based on LUCO Data

Appendix 4 - Mining Indicators
4.2: Mineral Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture /Settlement /Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total	Total Area by LRMP
PROVINCIAL TOTAL	4,653,559	1,918,328	5,284,664	14,068,441	344,908	1,122,069	3,218,984	15,107,289	23,017,369	1,887,956	24,102,599	94,726,166		
Provincial Totals (including unplanned areas)														
Metallic														
HIGH	844,703	692,334	911,920	3,401,026	53,875	66,835	845,921	2,980,970	5,554,041	648,396	6,729,131	**22,729,152**	100.0%	
MODERATE	1,310,546	775,575	1,875,094	3,650,051	122,358	429,835	818,493	4,437,959	6,778,926	448,348	7,995,074	**28,642,259**	100.0%	
LOW/NO	2,498,469	450,405	2,497,377	7,026,662	168,676	625,401	1,554,705	7,688,320	10,684,319	791,228	9,414,632	**43,400,194**	100.0%	94,771,605
Industrial														
HIGH	942,925	577,355	1,315,556	3,022,097	71,110	65,090	654,394	2,334,494	5,929,211	727,454	5,283,611	**20,923,297**	100.0%	
MODERATE	1,957,586	659,171	1,453,884	5,307,531	231,673	843,702	795,262	3,844,525	6,355,655	1,100,000	7,753,965	**30,302,954**	100.0%	
LOW/NO	1,752,274	681,788	2,515,076	5,748,100	42,124	213,280	1,769,461	8,928,229	10,732,420	60,523	11,061,680	**43,504,955**	100.0%	94,731,206
SLUP Totals														
Fort Nelson - Metallic														
HIGH	31,100	0	0	32,596	0	0	0	0	0			63,696	0.3%	
MODERATE	45,739	0	1,040	439,580				0	0			486,359	1.7%	
LOW/NO	833,238	0	151,193	2,334,327	0	0	0	3,683,537	2,295,756	0		9,298,051	21.4%	9,848,106
Fort Nelson -Industrial														
HIGH	97,880	0	90,593	384,719	0	0	0	10,059	220,790	0	0	804,041	3.8%	
MODERATE	480,676	0	58,034	1,399,360				4,152	380,287			2,322,509	7.7%	
LOW/NO	331,521	0	3,606	1,022,424				3,669,327	1,694,675			6,721,553	15.5%	9,848,103
Cassiar-Iskut - Metallic														
HIGH	32,427	0	3,961	405,138	1,132	0	0	0	258	0	0	442,916	1.9%	
MODERATE	121,593	0	118,252	406,246	108,601	0	0	0	643,584	0	0	1,398,276	4.9%	
LOW/NO	304,692	0	789,741	1,246,075	84,164	0	0	0	942,097	0		3,366,769	7.8%	5,207,961
Cassiar-Iskut - Industrial														
HIGH	44,972	0	114,826	214,482	12,619	0	0	0	219,473	0	0	606,372	2.9%	
MODERATE	79,144	0	97,249	630,094	169,218				481,506			1,457,211	4.8%	
LOW/NO	334,596	0	699,881	1,212,884	12,059	0	0	0	884,961			3,144,381	7.2%	5,207,964
Mackenzie - Metallic														
HIGH	154,782	0	308	441,229	0	66,835	1,975	461,231	175,542	0	0	1,301,902	5.7%	
MODERATE	180,607	0	18,349	352,639	0	429,835	23,328	561,308	464,939			2,031,005	7.1%	
LOW/NO	347,591	0	198,701	571,409	0	625,401	2,508	817,211	521,616			3,084,437	7.1%	6,417,344
Mackenzie - Industrial										0	0			
HIGH	89,965	0	2,081	301,245	0	65,091	24,423	694,610	447,402	0	0	1,624,817	7.8%	
MODERATE	419,375	0	153,628	568,754	0	843,702	1,083	810,964	387,949			3,185,455	10.5%	
LOW/NO	173,644	0	61,648	495,277		213,280	2,308	334,176	326,742			1,607,075	3.7%	6,417,347
Dawson Creek - Metallic														
HIGH	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	
MODERATE	0	0	0	1,524	0	0	0	0	24,551	0	0	26,075	0.1%	
LOW/NO	156,684	0	47,378	379,516	0	0	393,116	655,982	1,288,975	0		2,921,651	6.7%	2,947,726
Dawson Creek - Industrial														
HIGH	37,438	0	9,320	56,699	0	0	0	0	179,632	0	0	283,089	1.4%	
MODERATE	31,283	0	28,005	26,681					80,670			166,639	0.5%	
LOW/NO	87,957	0	10,054	297,660			393,116	655,982	1,053,223			2,497,992	5.7%	2,947,720

Appendix 4 - Mining Indicators
4.2: Mineral Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture /Settlement /Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total	Total Area by LRMP
Fort St John -Metallic														
HIGH	29,383	0	0	29,198	0	0	0	0	0	0		58,581	0.3%	
MODERATE	24,820	0	0	0	0	0	0	0	0	0		24,820	0.1%	
LOW/NO	150,520	0	2,884	815,875	0	0	557,265	931,568	2,136,767	0		4,594,879	10.6%	4,678,280
Fort St John- Industrial														
HIGH	89,377	0	0	78,558	0	0			0	0	0	167,935	0.8%	
MODERATE	63,200	0	2,069	253,710					6,748			325,727	1.1%	
LOW/NO	52,148	0	815	512,803			557,265	931,568	2,130,019			4,184,618	9.6%	4,678,280
Prince George -Metallic														
HIGH	12,117	0	2,126	21,282	0	0	178,175	178,220	1,453			393,373	1.7%	
MODERATE	57,939	1,044	21,844	197,568	0	0	163,361	799,663	384,941			1,626,360	5.7%	
LOW/NO	186,385	1,949	2,036	423,847	84,512		49,673	247,653	401,449			1,397,504	3.2%	3,417,237
Prince George -Industrial														
HIGH	63,323	0	709	343,598	36,022	0	12,376	233,258	428,939	0	0	1,118,225	5.3%	
MODERATE	147,332	2,993	2,216	184,541	48,488		77,659	378,291	246,189			1,087,709	3.6%	
LOW/NO	45,789	0	23,078	114,559	0		301,175	613,987	112,714			1,211,302	2.8%	3,417,236
Okanagan - Metallic														
HIGH	67,229	70	21,989	0		0	133,293	0	0	648,396	0	870,977	3.8%	
MODERATE	9,885	362	1,995	0	0	0	120,685	0	0	448,348	0	581,275	2.0%	
LOW/NO	45,339	376	46,645				112,944			791,228		996,532	2.3%	2,448,784
Okanagan - Industrial														
HIGH	49,988	361	19,102	0	0	0	207,851	0	0	727,454	0	1,004,756	4.8%	
MODERATE	45,147	446	23,445	0	0	0	133,888	0	0	1,100,000	0	1,302,926	4.3%	
LOW/NO	27,314	0	28,079				25,175			60,523		141,091	0.3%	2,448,773
Vancouver Island Metallic														
HIGH	56,301	41,700	117,792	203,149	0	0	386,089	467,671	561,130	0	0	1,833,832	8.1%	
MODERATE	49,198	0	149,595	28,829	0	0	201,272	280,372	321,159	0	0	1,030,425	3.6%	
LOW/NO	5,743	6,225	13,871	35,619	0	0	209,752	61,009	154,331			486,550	1.1%	3,350,807
Vancouver Island -Industrial														
HIGH	68,765	3,660	22,257	103,193	0	0	229,970	449,057	397,844	0	0	1,274,746	6.1%	
MODERATE	37,557	38,037	187,261	107,786			459,021	183,560	381,248			1,394,470	4.6%	
LOW/NO	4,916	6,225	71,739	56,620			108,121	176,432	257,525			681,578	1.6%	3,350,794
Lakes - Metallic														
HIGH	21,549	27	99,914	91,745	0	0	40,889	0	259,037	0	0	513,161	2.3%	
MODERATE	83,418	0	276,243	194,797	0	0	82,690	0	342,519			979,667	3.4%	
LOW/NO	0	0	63,065	17,656	0	0	0	0	4,621	0		85,342	0.2%	1,578,170
Lakes - Industrial														
HIGH	30	0	0	6,010	0	0	0	0	19,054			25,094	0.1%	
MODERATE	14,332	0	0	45,355	0	0	33,430	0	118,364	0	0	211,481	0.7%	
LOW/NO	90,606	25	439,222	252,832			90,153		468,758			1,341,596	3.1%	1,578,171

Appendix 4 - Mining Indicators

4.2: Mineral Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture /Settlement /Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total	Total Area by LRMP
Fort St James - Metallic														
HIGH	93,824	118	630	207,567	0	0	14,335	441,081	742,994	0	0	1,500,549	6.6%	
MODERATE	43,979	0	291	34,885	0	0	0	498,359	204,777	0	0	782,291	2.7%	
LOW/NO	49,191	0	2,965	278,387	0	0	0	77,191	482,043	0	0	889,777	2.1%	3,172,617
Fort St James - Industrial														
HIGH	26,102	118	0	38,789	0	0	0	277,278	146,346	0	0	488,633	2.3%	
MODERATE	76,272	0	2,291	159,160			14,129	198,912	307,064			757,828	2.5%	
LOW/NO	84,621	0	1,594	322,890	0	0	206	540,442	976,403	0	0	1,926,156	4.4%	3,172,617
Kamloops Metallic														
HIGH	39,189	50	15,593	255,326	0	0	17,150	0	960,145	0		1,287,453	5.7%	
MODERATE	15,447	0	148,001	121,238	0	0	738	0	183,906			469,330	1.6%	
LOW/NO	54,680	0	353,916	145,308	0	0	2,292	0	454,860	0		1,011,056	2.3%	2,767,839
Kamloops Industrial														
HIGH	40,300	0	147,589	198,751	0	0	6,128	0	596,033	0	0	988,801	4.7%	
MODERATE	31,892	51	237,194	169,481	0	0	13,545		665,818			1,117,981	3.7%	
LOW/NO	37,125	0	132,731	153,632			507	0	337,061			661,056	1.5%	2,767,838
Bulkley - Metallic	763835 ha													
HIGH	28,388	125	278	47,284	52,744	0	43,237	0	221,556	0		393,612	1.7%	
MODERATE	167	0	0	35,116	13,757	0	3,819	0	178,780	0	0	231,639	0.8%	
LOW/NO	10,970	0	22	5,664	0	0	21,513	0	100,411	0		138,580	0.3%	763,831
Bulkley- Industrial														
HIGH	0	0	0	20,128	22,468	0	0	0	30,706	0	0	73,302	0.4%	
MODERATE	54	0	0	24,889	13,967	0	9,039	0	41,636	0	0	89,585	0.3%	
LOW/NO	39,473	125	300	43,047	30,065		59,530	0	428,405			600,945	1.4%	763,832
Kispiox-Metallic														
HIGH	6,890	0	379	85,293	0	0	5,294	0	216,249	0	0	314,105	1.4%	
MODERATE	22,878	0	0	11,544	0	0	244	0	170,635	0	0	205,301	0.7%	
LOW/NO	78,164	0	29	126,756	0	0	28,578	0	471,337	0		704,864	1.6%	1,224,270
Kispiox-Industrial														
HIGH	3,124	0	0		0	0	659	0	38,111	0	0	41,894	0.2%	
MODERATE	3,741	0	378	71,838	0	0	4,634	0	108,866	0	0	189,457	0.6%	
LOW/NO	101,069	0	29	151,755			28,822	0	711,242			992,917	2.3%	1,224,268
Kootenay Boundary -Metallic														
HIGH	153,312	0	241,669	534,298	0	0	1,781	0	2,093,487	0	0	3,024,547	13.3%	
MODERATE	327,361	52	257,037	599,189	0	0	24,318	20,838	2,660,428			3,889,223	13.6%	
LOW/NO	54,712	0	113,477	148,128	0	0	123,624	50,036	825,939	0		1,315,916	3.0%	8,229,686
Kootenay Boundary -Industrial														
HIGH	246,708	0	457,785	720,361	0	0	81,338	44,755	2,791,739	0	0	4,342,686	20.8%	
MODERATE	284,679	52	122,646	497,242			1,491	0	2,265,589			3,171,699	10.5%	
LOW/NO	3,997	0	31,756	64,011			66,903	26,119	522,533			715,319	1.6%	8,229,704

Appendix 4 - Mining Indicators

4.2: Mineral Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture /Settlement /Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total	Total Area by LRMP
Robson Valley -Metallic														
HIGH	0	0	0	0	0	0	0	7,027	0	0	0	7,027	0.0%	
MODERATE	5,443	0	0	42,383	0	0	16,355	117,482	11,451	0		193,114	0.7%	
LOW/NO	66,384	0	222,352	326,931			53,238	323,722	264,788			1,257,415	2.9%	1,457,556
Robson Valley - Industrial														
HIGH	12,675	0	220,292	201,292	0	0	12,642	194,776	150,797	0	0	792,474	3.8%	
MODERATE	2,764	0	3	41,263			14,965	121,233	16,047			196,275	0.6%	
LOW/NO	56,393	0	2,064	126,759			41,987	132,222	109,396			468,821	1.1%	1,457,570
Cariboo-Chilcotin Metallic														
HIGH	63,510	134,582	9,126	878,169	0	0	0	1,070,185	140,320			2,295,892	10.1%	
MODERATE	275,306	97,248	108,494	1,093,456	0	0	1,392	1,732,912	1,117,431			4,426,239	15.5%	
LOW/NO	142,956	343	173,574	155,705	0	0	202	840,411	339,329	0	0	1,652,520	3.8%	8,374,651
Cariboo-Chilcotin - Industrial														
HIGH	68,505	24,162	460	338,078	0	0	940	374,444	262,343	0	0	1,068,932	5.1%	
MODERATE	200,240	139,026	50,745	946,499			527	1,824,739	718,392			3,880,168	12.8%	
LOW/NO	213,028	68,987	239,988	842,754	0	0	127	1,444,325	616,347			3,425,556	7.9%	8,374,656
Lower Mainland - Metallic														
HIGH	0	60,396	189,596	131,515	0	0	0	0	0	0	0	381,507	1.7%	
MODERATE	0	77,424	113,687	73,628	0	0	0	0	0	0	0	264,739	0.9%	
LOW/NO	0	58,397	85,759	15,459								159,615	0.4%	805,861
Lower Mainland - Industrial														
HIGH	0	12,954	9,807	16,195	0	0	0	0	0	0	0	38,956	0.2%	
MODERATE	0	96,598	122,499	146,779								365,876	1.2%	
LOW/NO	0	86,665	256,736	57,624								401,025	0.9%	805,857
Vanderhoof -Metallic														
HIGH	52,054	0	74	37,235			23,694	355,554	181,868			650,479	2.9%	
MODERATE	41,520	0	763	17,429	0	0	180,291	427,025	69,826	0	0	736,854	2.6%	
LOW/NO	0	0	0	0	0	0	0	0	0	0		0	0.0%	1,387,333
Vanderhoof - Industrial														
HIGH	2,136	0	0	0	0	0	78,066	56,256	0	0	0	136,458	0.7%	
MODERATE	35,286	0	270	34,096	0	0	31,851	322,675	149,281	0	0	573,459	1.9%	
LOW/NO	56,150	0	566	20,569			94,066	403,649	102,416			677,416	1.6%	1,387,333
TOTAL SLUPs and LOWER MAINLAND														
Metallic														
HIGH	842,055	237,068	703,435	3,401,024	53,876	66,835	845,912	2,980,969	5,554,039	648,396	0	15,333,609	67.5%	
MODERATE	1,305,300	176,130	1,215,591	3,650,051	122,358	429,835	818,493	4,437,959	6,778,927	448,348	0	19,382,992	67.7%	
LOW/NO	2,487,249	67,290	2,267,608	7,026,662	168,676	625,401	1,554,705	7,688,320	10,684,319	791,228	0	33,361,458	76.9%	68,078,059
Industrial														
HIGH	941,288	41,255	1,094,821	3,022,098	71,109	65,091	654,393	2,334,493	5,929,209	727,454	0	14,881,211	71.1%	
MODERATE	1,952,974	277,203	1,087,933	5,307,528	231,673	843,702	795,262	3,844,526	6,355,654	1,100,000	0	21,796,455	71.9%	
LOW/NO	1,740,347	162,027	2,003,886	5,748,100	42,124	213,280	1,769,461	8,928,229	10,732,420	60,523	0	31,400,397	72.2%	68,078,063

Appendix 4 - Mining Indicators

4.2: Mineral Capability

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture /Settlement /Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total	Total Area by LRMP
TOTAL SLUP AREAS														
Based on Metallic	4,634,604	480,488	4,186,634	14,077,737	344,910	1,122,071	3,219,110	15,107,248	23,017,285	1,887,972	0	68,078,059		
Based on Industrial	4,634,609	480,485	4,186,640	14,077,726	344,906	1,122,073	3,219,116	15,107,248	23,017,283	1,887,977	0	68,078,063		
% Based on Metallic	6.8%	0.7%	6.1%	20.7%	0.5%	1.6%	4.7%	22.2%	33.8%	2.8%	0.0%	100.0%		
EXCL. LOWER MAINLAND														
Based on Metallic	4,634,604	284,271	3,797,592	13,857,135	344,910	1,122,071	3,219,110	15,107,248	23,017,285	1,887,972	0	67,272,198		
Based on Industrial	4,634,609	284,268	3,797,598	13,857,128	344,906	1,122,073	3,219,116	15,107,248	23,017,283	1,887,977	0	67,272,206		
% Based on Metallic	6.9%	0.4%	5.6%	20.6%	0.5%	1.7%	4.8%	22.5%	34.2%	2.8%	0.0%	100.0%		
SLUP EXCLUDING LOWER MAINLAND														
Metallic														
HIGH	842,055	176,672	513,839	3,269,509	53,876	66,835	845,912	2,980,969	5,554,039	648,396	0	14,952,102	65.8%	
MODERATE	1,305,300	98,706	1,101,904	3,576,423	122,358	429,835	818,493	4,437,959	6,778,927	448,348	0	19,118,253	66.7%	
LOW/NO	2,487,249	8,893	2,181,849	7,011,203	168,676	625,401	1,554,705	7,688,320	10,684,319	791,228	0	33,201,843	76.5%	67,272,198
Industrial														
HIGH	941,288	28,301	1,085,014	3,005,903	71,109	65,091	654,393	2,334,493	5,929,209	727,454	0	14,842,255	70.9%	
MODERATE	1,952,974	180,605	965,434	5,160,749	231,673	843,702	795,262	3,844,526	6,355,654	1,100,000	0	21,430,579	70.7%	
LOW/NO	1,740,347	75,362	1,747,150	5,690,476	42,124	213,280	1,769,461	8,928,229	10,732,420	60,523	0	30,999,372	71.3%	67,272,206

Appendix 4 - Mining Indicators

4.3: Mineral Occurrences

Mineral Occurrences (Number of Sites)	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	LRMP PAS Approved	Not Yet Planned	Provincial Total	% of Provincial Total
B.C. - # occurrences	337	151	313	2,017	69	60	648	826	3,525	474	663	2,953	12,036	100.0%
% by zone - B.C.	2.8%	1.3%	2.6%	16.8%	0.6%	0.5%	5.4%	6.9%	29.3%	3.9%	5.5%	24.5%	100.0%	

Mineral Occurrences by LRMP (#sites)

	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	LRMP PAS Approved	Not Yet Planned	Provincial Total	% of Provincial Total
Fort Nelson														
# occurrences	29	0	6	92				6	21				154	1.3%
% by zone by region	19%	0%	4%	60%	0%	0%	0%	4%	14%	0%	0%	0%	100%	
Cassiar-Iskut														
# occurrences	26	0	2	440	27				105				600	5.0%
% by zone by region	4%	0%	0%	73%	5%	0%	0%	0%	18%	0%	0%	0%	100%	
Mackenzie														
# occurrences	19	0	2	287		60	2	171	87				628	5.2%
% by zone by region	3%	0%	0%	46%	0%	10%	0%	27%	14%	0%	0%	0%	100%	
Dawson Creek														
# occurrences	11			14			5	20	27				77	0.6%
% by zone by region	14%	0%	0%	18%	0%	0%	6%	26%	35%	0%	0%	0%	100%	
Fort St John														
# occurrences	14			16			1		7				38	0.3%
% by zone by region	37%	0%	0%	42%	0%	0%	3%	0%	18%	0%	0%	0%	100%	
Prince George														
# occurrences	10			15			18	33	16				92	0.8%
% by zone by region	11%	0%	0%	16%	0%	0%	20%	36%	17%	0%	0%	0%	100%	
Okanagan														
#occurrences	29	0	10				170			474			683	5.7%
% by zone by region	4%	0%	1%	0%	0%	0%	25%	0%	0%	69%	0%	0%	100%	
Vancouver Island														
# occurrences	20	7	62	158			347	234	444				1,272	10.6%
% by zone by region	2%	1%	5%	12%	0%	0%	27%	18%	35%	0%	0%	0%	100%	
Lakes														
# occurrences	3		19	25			7		28				82	0.7%
% by zone by region	4%	0%	23%	30%	0%	0%	9%	0%	34%	0%	0%	0%	100%	
Fort St James														
# occurrences	18			28			4	61	187				298	2.5%
% by zone by region	6%	0%	0%	9%	0%	0%	1%	20%	63%	0%	0%	0%	100%	
Kamloops														
# occurrences	24	0	11	54			14		492				595	4.9%
% by zone by region	4%	0%	2%	9%	0%	0%	2%	0%	83%	0%	0%	0%	100%	
Bulkley														
# occurrences	19	0	0	32	42		7		75				175	1.5%
% by zone by region	11%	0%	0%	18%	24%	0%	4%	0%	43%	0%	0%	0%	100%	
Kispiox														
# occurrences	13	0	0	37			22		103				175	1.5%
% by zone by region	7%	0%	0%	21%	0%	0%	13%	0%	59%	0%	0%	0%	100%	
Kootenay Boundary														
#occurrences	68	0	64	496			37	26	1,864				2,555	21.2%
% by zone by region	3%	0%	3%	19%	0%	0%	1%	1%	73%	0%	0%	0%	100%	
Robson Valley														
# occurrences	2	0	3	5			2	3	3				18	0.1%

4.3: Mineral Occurrences

Mineral Occurrences (Number of Sites)	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	LRMP PAS Approved	Not Yet Planned	Provincial Total	% of Provincial Total
% by zone by region	11%	0%	17%	28%	0%	0%	11%	17%	17%	0%	0%	0%	100%	
Cariboo-Chilcotin														
# occurrences	21	17	7	269			1	238	46				599	5.0%
% by zone by region	4%	3%	1%	45%	0%	0%	0%	40%	8%	0%	0%	0%	100%	
Lower Mainland														
# occurrences	0	21	29	46							663		759	6.3%
% by zone by region	0%	3%	4%	6%	0%	0%	0%	0%	0%	0%	87%	0%	100%	
Vanderhoof														
# occurrences	7	0	0	3			11	34	20				75	0.6%
% by zone by region	9%	0%	0%	4%	0%	0%	15%	45%	27%	0%	0%	0%	100%	
TOTAL SLUPS and Lower Mainland PAs/ SMZs														
# occurrences	333	45	215	2,017	69	60	648	826	3,525	474	663	0	8,875	73.7%
% by zone by region	4%	1%	2%	23%	1%	1%	7%	9%	40%	5%	7%	0%	100%	
Not planned														
# occurrences	4	106	98									2,953	3,161	26.3%
% by zone by region	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	93%	100%	
TOTAL B.C.	337	151	313	2,017	69	60	648	826	3,525	474	663	2,953	12,036	174%
TOTAL SLUPS (EXCLUDING LOWER MAINLAND)														
# occurrences	333	24	186	1,971	69	60	648	826	3,525	474	0	0	8,116	67.4%
% by zone by region	4.1%	0.3%	2.3%	24.3%	0.9%	0.7%	8.0%	10.2%	43.4%	5.8%	0%	0%	100%	

MINERAL OCCURRENCES

Regional Summary (Excluding Lower Mainland)	New SLUP Protected	New Non SLUP Protected	Original Protected	Total Protected	Special Zones	Agriculture/ Settlement/ Private	Enhanced	General/ Unclassified	Total	% of Provincial Total
Fort Nelson	19%	0%	4%	23%	60%	0%	4%	14%	100%	1%
Cassiar-Iskut	4%	0%	0%	5%	78%	0%	0%	18%	100%	5%
Mackenzie	3%	0%	0%	3%	55%	0%	27%	14%	100%	5%
Dawson Creek	14%	0%	0%	14%	18%	6%	26%	35%	100%	1%
Fort St John	37%	0%	0%	37%	42%	3%	0%	18%	100%	0%
Prince George	11%	0%	0%	11%	16%	20%	36%	17%	100%	1%
Okanagan	4%	0%	1%	6%	0%	25%	0%	69%	100%	6%
Vancouver Island	2%	1%	5%	7%	12%	27%	18%	35%	100%	11%
Lakes	4%	0%	23%	27%	30%	9%	0%	34%	100%	1%
Fort St James	6%	0%	0%	6%	9%	1%	20%	63%	100%	2%
Kamloops	4%	0%	2%	6%	9%	2%	0%	83%	100%	5%
Bulkley	11%	0%	0%	11%	42%	4%	0%	43%	100%	1%
Kispiox	7%	0%	0%	7%	21%	13%	0%	59%	100%	1%
Kootenay Boundary	3%	0%	3%	5%	19%	1%	1%	73%	100%	21%
Robson Valley	11%	0%	17%	28%	28%	11%	17%	17%	100%	0%
Cariboo-Chilcotin	4%	3%	1%	8%	45%	0%	40%	8%	100%	5%
Vanderhoof	9%	0%	0%	9%	4%	15%	45%	27%	100%	1%
TOTAL SLUPS	4%	0%	2%	7%	26%	8%	10%	49%	100%	67%

Change To Lower Mainland - move from new SLUP Protected to Non-SLUP protected

Appendix 4 - Mining Indicators
4.3: Mineral Occurrences

Mineral Occurrences (Number of Sites)	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	LRMP PAS Approved	Not Yet Planned	Provincial Total	% of Provincial Total
Lower Mainland														
# occurrences	21	0												
Provincial Totals - Before change to Lower Mainland														
B.C. - # occurrences	358	130												

Appendix 4 - Mining Indicators
4.4: Mineral Tenures
(Tenures as at January 31, 2001)

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total
PROVINCIAL TOTAL	4,653,559	1,918,328	5,284,664	14,068,441	344,908	1,122,069	3,218,984	15,107,289	23,017,369	1,887,956	24,102,599	94,726,166	

Provincial Totals

Mineral Tenures (as at 01/31/2001)	30,106	25,096	8,325	695,041	11,404	9,853	50,218	401,471	926,373	69,496	784,880	**3,012,263**
Coal Tenures (as at 01/31/2001)	450	0	154	20,370	0	0	18,169	56,253	78,263	0	4,149	**177,808**
Placer Tenures (as at 01/31/2001)	802	341	46	39,358	0	0	3,270	39,601	19,797	1,901	45,800	**150,916**

LRMP Totals

Fort Nelson Tenures

Mineral	0	0	0	7,155	0	0	0	25	1,330	0	0	8,510	0.3%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	25	0	0	0	100		0	125	0.1%

Cassiar-Iskut Tenures

Mineral	3,332	0	185	162,562	11,014	0	0	0	19,234	0	0	196,327	6.5%
Coal	329	0	20	14,736	0	0	0	0	0	0	0	15,085	8.5%
Placer	0	0	0	596	0	0	0	0	587	0	0	1,183	0.8%

Mackenzie Tenures

Mineral	686	0	0	99,003	0	9,853	52	74,340	31,914	0	0	215,848	7.2%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	150	0	0	6,133	0	0	333	664	3,964	0	0	11,244	7.5%

Dawson Creek Tenures

Mineral	4,924	0	0	4,343	0	0	0	25	604	0	0	9,896	0.3%
Coal	0	0	0	5,189	0	0	141	17,362	53,991	0	0	76,683	43.1%
Placer	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

Fort St John Tenures

Mineral	0	0	0	1,739			0	0	0			1,739	0.1%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

Prince George Tenures

Mineral	1,127	0	62	5,516	0	0	2,018	6,597	14,583	0	0	29,903	1.0%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	232	0	0	1,007	4,063	65	0	0	5,367	3.6%

Okanagan Tenures

Mineral	2,100	0	215	0	0	0	9,496	0	0	69,496	0	81,307	2.7%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	0	0	77	0	0	1,901	0	1,978	1.3%

Vancouver Island Tenures

Mineral	2,432	210	3,628	14,003	0	0	24,797	50,807	46,713	0	0	142,590	4.7%

Appendix 4 - Mining Indicators

4.4: Mineral Tenures

(Tenures as at January 31, 2001)

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total
Coal	2	0	134	0	0	0	12,243	0	615	0	0	12,994	7.3%
Placer	262	0	1	0	0	0	1,466	774	134	0	0	2,637	1.7%
Lakes Tenures													
Mineral	31	0	91	6,408	0	0	753	0	16,603	0	0	23,886	0.8%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	44	0	0	221	0	23	0	0	288	0.2%
Fort St James Tenures													
Mineral	1,821	0	14	7,050	0	0	0	35,537	47,854	0	0	92,276	3.1%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	188	0	0	0	0	0	0	519	2,033	0		2,740	1.8%
Kamloops Tenure													
Mineral	1,908	0	67	17,549	0	0	1,064	0	196,934	0	0	217,522	7.2%
Coal	118	0	0	0	0	0	0	0	8,270			8,388	4.7%
Placer	0	0	0	150	0	0	0	0	203	0	0	353	0.2%
Bulkley Mineral Tenures													
Mineral	0	0	0	8,325	390	0	24	0	8,579	0	0	17,318	0.6%
Coal	0	0	0	445	0	0	3,096	0	6,837	0	0	10,378	5.8%
Placer	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Kispiox Tenures													
Mineral	0	0	2	217	0	0	254	0	3,659	0	0	4,132	0.1%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	0	0	30	0	20	0	0	50	0.0%
Kootenay Boundary Tenures													
Mineral	4,054	0	122	127,404	0	0	9,549	6,962	503,722	0	0	651,813	21.6%
Coal	1	0	0	0	0	0	2,689	38,891	8,550			50,131	28.2%
Placer	1	0	0	2,055	0	0	0	0	11,519	0	0	13,575	9.0%
Robson Valley Tenures													
Mineral	983	0	0	335	0	0	1,762	0	897	0	0	3,977	0.1%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	0	0	0	49	0	0	0	49	0.0%
Cariboo-Chilcotin Tenures													
Mineral	1,667	2	494	207,219	0	0	2	219,851	19,641	0	0	448,876	14.9%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	199	0	33	28,991	0	0	136	33,347	1,149	0	0	63,855	42.3%

Appendix 4 - Mining Indicators

4.4: Mineral Tenures

(Tenures as at January 31, 2001)

AREA is reported in hectares	New SLUP Protected	New Non SLUP Protected	Original Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total	% of Prov. Total
Lower Mainland Tenures													
Mineral	0	6	587	24,130	0	0	0	0	0	0	0	24,723	0.8%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	2	1,132	0	0	0	0	0	0	0	1,134	0.8%
Vanderhoof Tenures													
Mineral	4,645	0	0	2,083	0	0	447	7,327	14,106	0	0	28,608	0.9%
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Placer	0	0	0	0	0	0	0	185	0	0	0	185	0.1%
Total Planned Areas and Lower Mainland													
Mineral	29,710	218	5,467	695,041	11,404	9,853	50,218	401,471	926,373	69,496	0	2,199,251	73.0%
Coal	450	0	154	20,370	0	0	18,169	56,253	78,263	0	0	173,659	97.7%
Placer	800	0	36	39,333	25	0	3,270	39,601	19,797	1,901	0	104,763	69.4%
Total Planned Areas (Excluding Lower Mainland)													
Mineral	29,710	212	4,880	670,911	11,404	9,853	50,218	401,471	926,373	69,496	0	2,174,528	72.2%
Coal	450	0	154	20,370	0	0	18,169	56,253	78,263	0	0	173,659	97.7%
Placer	800	0	34	38,201	25	0	3,270	39,601	19,797	1,901	0	103,629	68.7%

Change To Lower Mainland - move from new SLUP Protected to Non-SLUP protected

Lower Mainland - Tenures

Mineral	6	0
Coal	0	0
Placer	0	0

Provincial Totals - Before change to Lower Mainland

Mineral Tenures (as at 01/31/2001)	30,112	25,090
Coal Tenures (as at 01/31/2001)	450	0
Placer Tenures (as at 01/31/2001)	802	341

Appendix 4 - Mining Indicators

4.5: Exploration Spending by Provinces And Territories

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999(P)	2000(I)	5 Year Total	5 Year Rank	10 Year Total	10 Year Rank	15 Year Total	1987 to 1990	1999 to 2000	% Change
									(current million dollars)														
Alberta	3	3	5	6	11	7	5	7	9	11	11	20	27	18	17	94	9	134	9	162	6.3	17.6	179%
B.C.	84	143	230	187	227	136	72	66	85	79	105	96	55	42	42	339	4	777	4	1,648	196.7	42.1	-79%
Manitoba	31	46	35	37	41	30	32	27	41	33	41	40	30	26	25	162	7	325	7	515	39.8	25.4	-36%
New Brunswick	13	11	16	14	17	16	12	11	10	13	15	12	10	9	8	54	11	116	10	187	14.4	8.5	-41%
Newfoundland	14	32	44	36	23	12	11	9	12	71	93	58	48	32	23	254	5	370	6	519	33.8	27.7	-18%
NWT	42	68	77	46	36	32	43	101	150	172	195	151	157	103	119	724	1	1,221	1	1,490	56.7	144.8	155%
Nova Scotia	20	48	54	21	11	4	3	2	2	3	7	7	6	4	6	30	12	44	12	198	33.6	5.0	-85%
Nunavut*														31	36	67	10	67	11	67	Included in NWT		
Ontario	159	358	387	218	153	110	77	76	113	130	195	176	115	85	102	673	2	1,179	3	2,463	281.5	93.3	-67%
Quebec	281	482	379	185	196	138	94	106	130	123	137	169	127	109	77	619	3	1,211	2	2,734	310.5	93.1	-70%
Saskatchewan	43	74	71	63	42	31	26	53	51	44	51	50	62	28	35	226	6	430	5	724	62.6	31.7	-49%
Yukon	33	34	45	15	18	16	10	19	26	39	46	41	20	14	12	132	8	242	8	387	28.0	12.7	-55%
Canada	723	1299	1353	828	775	532	385	477	628	718	895	820	657	502	502	3,591		6,116		11,094	1063.8	501.8	-53%

B.C.'s Share of Canadian Expenditures

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999(P)	2000(I)	Average	Weighted Average
B.C.	84	143	230	187	227	136	72	66	85	79	105	96	55	42	42	109.9	14.9%
Rest of Cda	639	1156	1123	641	548	396	314	411	543	638	790	724	602	459	460	629.7	
Canada	723	1299	1353	828	775	532	385	477	628	718	895	820	657	502	502	739.6	
B.C. % of Cda	11.7%	11.0%	17.0%	22.5%	29.3%	25.6%	18.6%	13.8%	13.5%	11.1%	11.7%	11.7%	8.3%	8.4%	8.3%	14.8%	

B.C. as a Percent of Ontario, Quebec and B.C. Expenditures

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999(P)	2000(I)	5 Year Total	5 Year Rank	10 Year Total	10 Year Rank	15 Year Total
									(current million dollars)											
B.C.	84	143	230	187	227	136	72	66	85	79	105	96	55	42	42	339	4	777	4	1,648
Ontario	159	358	387	218	153	110	77	76	113	130	195	176	115	85	102	673	2	1,179	3	2,463
Quebec	281	482	379	185	196	138	94	106	130	123	137	169	127	109	77	619	3	1,211	2	2,734
Total	524	983	1086	589	576	384	243	248	328	332	437	441	296	236	221	1,743		3,167		6,845
Share (%) of Total																				
B.C. %	16.1%	14.6%	22.8%	31.6%	39.4%	35.4%	29.5%	26.6%	25.9%	23.9%	24.0%	21.7%	18.4%	17.9%	19.0%	19.8%		24.5%		24.1%
Ontario %	30.3%	36.4%	39.5%	37.0%	26.6%	28.6%	31.8%	30.5%	34.4%	39.0%	44.6%	40.0%	38.7%	36.0%	46.1%	38.6%		37.2%		36.0%
Quebec %	53.6%	49.0%	37.7%	31.4%	34.0%	35.9%	38.7%	42.8%	39.7%	37.1%	31.4%	38.2%	42.9%	46.2%	34.9%	35.5%		38.2%		39.9%
Total - %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	94%		100%		100%

Notes:

P = Preliminary, I = Intentions

Expenditures include general and minesite exploration plus overhead.

Source: Federal/Provincial Annual Survey of Canadian Mineral Exploration Expenditures, prepared by B.C. Ministry of Energy and Mines (MEM); Updated, May 15, 2000

Appendix 4 - Mining Indicators

4.6: Mineral Price Index

Prices included are copper, lead, zinc, gold, silver and metallurgical coal.

Year	Mineral Price Index	1979 = 100	1986 = 100
1979	3.26	100	125
1980	4.10	126	157
1981	3.37	103	129
1982	3.18	98	122
1983	2.86	88	110
1984	2.66	82	102
1985	2.59	79	99
1986	2.61	80	100
1987	2.99	92	115
1988	3.39	104	130
1989	3.51	108	134
1990	3.46	106	132
1991	2.92	90	112
1992	2.97	91	114
1993	2.72	83	104
1994	3.02	92	115
1995	3.25	100	125
1996	3.15	96	121
1997	3.09	95	118
1998	2.68	82	103
1999	2.53	77	97
2000	2.55	78	98

Source: B.C. Ministry of Energy and Mines; as reported in *Overview of Trends in Canadian Mineral Exploration,* Canadian Intergovernmental Working Group on the Mineral Industry, 2000.

Appendix 5 - Oil and Gas Indicators

5.1: Oil and Gas Reserves and Gas Tenures

	Dawson Creek		Fort St. John		Fort Nelson		Mackenzie		Total		Total Excluding Mackenzie	
Total Plan Area	Hectares	%		%		%		%		%		%
Existing PAs	50,422	1.7%	46,770	1.0%	177,830	1.8%	216,648	3.4%	491,670	2.1%	275,022	1.6%
New PAs	151,266	5.1%	201,111	4.3%	908,909	9.2%	662,688	10.4%	1,923,974	8.1%	1,261,286	7.2%
SMZs	382,614	12.9%	678,165	14.5%	2,865,041	29.0%	2,625,264	41.2%	6,551,084	27.4%	3,925,820	22.4%
Other	2,381,698	80.3%	3,750,954	80.2%	5,927,671	60.0%	2,867,400	45.0%	14,927,723	62.5%	12,060,323	68.8%
Total	2,966,000	100.0%	4,677,000	100.0%	9,879,451	100.0%	6,372,000	100.0%	23,894,451	100.0%	17,522,451	100.0%
Total Hectares	Hectares	%		%		%		%		%		%
High Proven Gas	86,438	2.9%	193,722	4.1%	52,059	0.5%		0.0%	332,219	1.4%	332,219	1.9%
Moderate Proven Gas	25,990	0.9%	134,962	2.9%	14,029	0.1%		0.0%	174,981	0.7%	174,981	1.0%
High Proven Oil	3,402	0.1%	29,440	0.6%	132	0.0%		0.0%	32,974	0.1%	32,974	0.2%
Moderate Proven Oil	2,122	0.1%	29,981	0.6%	795	0.0%		0.0%	32,898	0.1%	32,898	0.2%
High Potential Gas	2,875,163	96.9%	3,869,848	82.7%	2,749,633	27.8%	3,831	0.1%	9,498,477	39.8%	9,494,644	54.2%
Moderate Potential Gas	38,977	1.3%	791,053	16.9%	3,162,232	32.0%	386,608	6.1%	4,378,871	18.3%	3,992,262	22.8%
Gas Tenures	1,049,016	35.4%	2,754,804	58.9%	1,322,045	13.4%	39,000	0.6%	5,164,866	21.6%	5,125,865	29.3%
High Proven Gas												
Existing PAs	173	0.20%	0	0.00%	0	0.00%			173	0.05%	173	0.05%
New PAs	3,285	3.80%	0	0.00%	0	0.00%			3,285	0.99%	3,285	0.99%
SMZs	3,717	4.30%	5,230	2.70%	0	0.00%			8,947	2.69%	8,947	2.69%
Moderate Proven Gas												
Existing PAs	0	0.00%	0	0.00%	0	0.00%			0	0.00%	0	0.00%
New PAs	286	1.10%	270	0.20%	0	0.00%			556	0.32%	556	0.32%
SMZs	442	1.70%	8,368	6.20%	0	0.00%			8,809	5.03%	8,809	5.03%
High Proven Oil												
Existing PAs	0	0.00%	0	0.00%	0	0.00%			0	0.00%	0	0.00%
New PAs	0	0.00%	147	0.50%	0	0.00%			147	0.45%	147	0.45%
SMZs	0	0.00%	4,563	15.50%	0	0.00%			4,563	13.84%	4,563	13.84%
Moderate Proven Oil												
Existing PAs	0	0.00%	0	0.00%	0	0.00%			0	0.00%	0	0.00%
New PAs	0	0.00%	0	0.00%	0	0.00%			0	0.00%	0	0.00%
SMZs	72	3.40%	1,439	4.80%	0	0.00%			1,511	4.59%	1,511	4.59%
High Potential Gas												
Existing PAs	48,878	1.70%	0	0.00%	0	0.00%	0	0.00%	48,878	0.51%	48,878	0.51%
New PAs	140,883	4.90%	197,362	5.10%	604,919	22.00%	0	0.00%	943,164	9.93%	943,164	9.93%
SMZs	359,395	12.50%	657,874	17.00%	563,675	20.50%	644	16.80%	1,581,588	16.65%	1,580,944	16.65%
Moderate Potential Gas												
Existing PAs	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
New PAs	2,144	5.50%	2,373	0.30%	79,056	2.50%	0	0.00%	83,573	1.91%	83,573	2.09%
SMZs	1,442	3.70%	20,567	2.60%	205,545	6.50%	159,282	41.20%	386,837	8.83%	227,555	5.70%
Gas Tenures												
Existing PAs	1,049	0.10%	0	0.00%	0	0.00%		0.00%	1,049	0.02%	1,049	0.02%
New PAs	12,588	1.20%	16,529	0.60%	1,322	0.10%		0.00%	30,439	0.59%	30,439	0.59%
SMZs	86,019	8.20%	159,779	5.80%	3,966	0.30%		0.00%	249,764	4.84%	249,764	4.87%

Source:

Based on data prepared by the Ministry of Employment and Investment (Gord Enemark), 2001.

Appendix 5 - Oil and Gas Indicators
5.2: Oil and Gas Tenures

AREA is reported in hectares	**New Protected**	**Non SLUP Protected**	**Original Protected**	**Special**	**Special - No Logging**	**Special - Wildland**	**Agriculture/ Settlement/ Private**	**Enhanced**	**General**	**Unclassified**	**Not Yet Planned**	**Provincial Total**
Petroleum and Natural Gas Tenures (as at January 2001)	24,262	0	439	0	380,241	0	710,344	2,669,581	2,106,765	0	0	**5,891,632**
% by Type of Zone	0.4%	0.0%	0.0%	0.0%	6.5%	0.0%	12.1%	45.3%	35.8%	0.0%	0.0%	100.0%

Note: The data differ somewhat from the summary data prepared by the Ministry of Employment and Investment reported in Appendix 5-1. The MEI summary information is based on the Socio-Economic Analyses (SEAs) prepared for Fort St. John, Dawson Creek, Fort Nelson and Mackenzie. The MEI data include only gas tenures whereas the LUCO data include oil and gas tenures. Also, oil and gas tenures lapse when inactive and the LUCO information is more recent than the SEA data.

Source: Land Use Coordination Office.

Appendix 5 - Oil and Gas Indicators
5.3: Estimated SLUP Impact on Gas Reserves, Jobs and Government Revenues

	Dawson Creek		Fort St. John		Fort Nelson		Mackenzie		Total	
Gas Reserves (trillion cubic feet)		%		%		%		%		%
Maximum Potential	21.6		20.1		10.9				52.6	
Less: New PAs	0.6	3%	1.0	5%	1.6	15%			3.2	6%
Forest Practices Code	0.6	3%	0.5	2%	0.3	3%			1.4	3%
LRMP management strategies	1.4	6%	2.1	10%	0.6	6%			4.1	8%
Net Maximum Potential	19.0	-12%	16.5	-18%	8.4	-23%			43.9	-17%
Average Annual Job Impacts:										
Maximum Potential	400		909		550				1,859	
Less: New PAs	12	3%	46	5%	82	15%			140	8%
Forest Practices Code	22	6%	27	3%	17	3%			66	4%
LRMP management strategies	14	4%	90	10%	33	6%			137	7%
Net Maximum Potential	352	-12%	746	-18%	418	-24%			1,516	-18%
Jobs in Area at Time of Analysis	330		700		350				1,380	
Average Annual B.C. Government Revenues:	($ millions lost)		($ millions lost)		($ millions lost)		($ millions lost)		($ millions lost)	
Cost of Following:										
New PAs	$4		$6		$21				$31	
Forest Practices Code	$4		$3		$4				$11	
LRMP management strategies	$12		$14		$3				$29	
Net Impact	$20		$23		$28				$71	
Government Revenues (at time of analysis)	$ millions $67		$ millions $286		$ millions $70		$ millions		$ millions $423	

Notes:

1. Potential gas reserves were reduced by 3% to reflect the higher costs of meeting Forest Practices Code (FPC) regulations. This includes: incremental requirements for logging plans for roads and seismic surveys, operational restrictions in riparian management zones, and added requirements for roads.
2. The number of existing jobs is based on data for the following years: Dawson Creek (1996), Fort St. John (1991) and Fort Nelson (1991-1996).
3. The government revenues at time of analysis is based on data for the following years: Dawson Creek (1994), Fort St. John (1994), Fort Nelson (1993/1994).
4. The estimated government revenues represent an annual average of the Present Value of the foregone production royalties and land bonus bid revenues discounted at a rate of 6%. For example, for Dawson Creek, the present value of provincial government revenues is estimated at $1.9 billion and LRMP strategies are estimated to reduce the lump sum by $140 million, or a reduction in annual revenues of about $12 million for 20 years (at 6% discount rate).
5. The socio-economic assessment (SEA) for the Mackenzie LRMP did not do a similar analysis. However, in the SEA for Mackenzie, the estimated potential marketable gas reserves is estimated at 3.1 trillion cubic feet.

Source:

Socio-Economic & Environmental Assessment for Dawson Creek LRMP, 1999.
Socio-Economic & Environmental Assessment for Fort Nelson LRMP, 1997.
Socio-Economic & Environmental Assessment for Mackenzie LRMP, 2000.
Fort St. John LRMP.

Appendix 6 - Tourism Indicators

			Protected Areas (PAs)			Special Management Zones							
	Total	Total Planned	New SLUP PAs	New Non-SLUP PAs	Original PAs	Special	No Logging	Wildland	Enhanced	General	Agriculture Settlement	Unidentified	Not planned
Existing Tourism Use Areas (ha)	19,928,372	11,728,883	771,341	462,389	1,629,585	3,092,450	108,025	17,608	1,200,625	4,171,658	275,202	46,005	8,153,484
Special Features (# sites)	13,397	6,892	679	174	1,100	1,654	30	72	1,342	1,061	780	142	6,363
Accommodations (# sites)	3,344	2,285	23	4	56	235	0	0	184	433	1,350	5	1,054
Percentage of Total													
Existing Tourism Use Areas (ha)		100.0%	6.6%	3.9%	13.9%	26.4%	0.9%	0.2%	10.2%	35.6%	2.3%	0.4%	69.5%
Special Features (# sites)		100.0%	9.9%	2.5%	16.0%	24.0%	0.4%	1.0%	19.5%	15.4%	11.3%	2.1%	92.3%
Accommodations (# sites)		100.0%	1.0%	0.2%	2.5%	10.3%	0.0%	0.0%	8.1%	18.9%	59.1%	0.2%	46.1%

Notes:

1. Existing Tourism Use Areas (ha) are identified by tourism outdoor operators as key areas for their businesses and their clients. Uses range from wildlife viewing and guided hunting/ fishing, heli-skiing and other forms of back-country recreation.

2. Tourism Features include:
- trails, land route, river recreation/lake based route, ocean route, winter route, road used for tourism activity and air route/ flight corridors;
- activity use areas - climbing, diving, fishing, kayak, other;
- airfield, airstrip, aircraft landing, helicopter landing, anchorage, boat ramp, dock and wharfs;
- beaches, estuary, hot spring/ thermal spring, mountain peak, waterfall, wildlife viewing/ wildlife site and other viewpoint/ scenic viewing sites;
- Campground/campsite (federal, municipal, provincial and regional), campsite - wilderness;
- heritage/ historic sites with tourism value;
- Ministry of Forests existing and proposed Recreation Sites, Ministry of Forests Recreation Reserve (RECRES); and
- picnic sites, trailhead and other infrastructure or cultural feature.

3. Accommodation Properties include hotels, motels, RV/ campground, lodges/ resorts, camps, huts/cabins/ cottages, guest ranches/farms, bed and breakfasts, condominiums, hostels, cruise ships, vessel lodges, float camps, charter boats, motel/condo and other accommodations.

4. For this table, the total planned area includes the Lower Mainland PAs and some small management areas. As a result, the Lower Mainland PAs are included as new SLUP PAs instead of new non-SLUP PAs as was done for the forestry, mining and oil and gas indicators.

Source: Ministry of Small Business, Tourism and Culture and Land Use Coordination Office.

Appendix 7 - B.C. Agricultural Land Reserve by Type of Zone

AREA is reported in hectares	New SLUP Protected	New Non-SLUP Protected	Original Protected	Total Protected	Special	Special - No Logging	Special - Wildland	Agriculture/ Settlement/ Private	Enhanced	General	Unclassified	Not Yet Planned	Provincial Total
PROVINCIAL TOTAL	4,844,035	1,727,852	5,284,664	11,856,551	14,068,441	344,908	1,122,069	3,218,984	15,107,289	23,017,369	1,887,956	24,102,599	94,726,166
Agricultural Land Reserve	67,219	230	9,887	77,336	289,805	0	0	1,548,766	1,116,048	1,009,122	43,918	473,931	4,558,926
ALR as a % of B.C.	1.4%	0.0%	0.2%	0.7%	2.1%	0.0%	0.0%	48.1%	7.4%	4.4%	2.3%	2.0%	4.8%
Percentage by Zone:													
Provincial Total	5.1%	1.8%	5.6%	12.5%	14.9%	0.4%	1.2%	3.4%	15.9%	24.3%	2.0%	25.4%	100.0%
Agricultural Land Reserve	1.5%	0.0%	0.2%	1.7%	6.4%	0.0%	0.0%	34.0%	24.5%	22.1%	1.0%	10.4%	100.0%

Note: For this table, the total planned area includes the Lower Mainland protected areas and some small special management areas. As a result, the Lower Mainland PAs are included as new-SLUP PAs instead of new non-SLUP PAs as was done for the forestry, mining and oil and gas indicators.

Source: Land Use Coordination Office.

Appendix 8 – List of Contacts

Meeting/ Contact Records		Affiliation	Contact Person	Phone Number	Fax number	Sector	Type of Org.	Region
Interview March 2	*	BC Cattlemen's Association (Kamloops)	David Borth	573-3611	573-5155	Ag/Range	A	Kamloops
Interview Feb. 28	*		Darwin Dunbar	780-2372	780-2372	Ag/Range	P	Dawson Creek
Interview March 6	*	Burns Lake, Chamber of Commerce & Community Forest	Ken Guenter (fax first sent to Susan Schienbein)	692-7724	692-7722	Community	A	Lakes
Interview March 2	*	Central Okanagan Regional District	Leah Hartley Growth Strategies Coordinator	868-5227	762-7011	Community	PS	Okanagan/ Kamloops
Interview March 8	*	City of Campbell River	Jim Lornie, former Mayor	286-5700	286-5760	Community	PS	Campbell River
Sent fax March 5	*	City of Williams Lake	Walter Cobb, former Mayor	398-2642	398-2678	Community	PS	Williams Lake
Sent fax March 1	*	District of Fort St. James	Mayor Jim Togyi	996-8233	996-2248	Community	PS	Fort St. James
Interview March 8	*	Regional District of Kitimat-Stikine	Fred Roisum, Director	615-6100	842-5917	Community	PS	
Interview March 8	*	Union of BC Municipalities	Richard Taylor and Marie Crawford	(604) 270-8226	270-9116	Community	PS	B.C.
SG/ Met March 6	*	Tahltan Nation	Glenda Ferris	845-3177		Environment		Cassiar
SG/ SL Interview	*	BC Environment, Habitat Branch	Liz Williams, Sr. Land Use Advisor	356-6605		Environment	PS	B.C.
SG/ SL Interview	*	BC Environment, Kamloops	Dave Whiting,	371-6275		Environment	PS	Kamloops
SG/ SL Interview	*	BC Environment, Nelson	Kathy Eichenberger,	354-6349		Environment	PS	Nelson
SG Interview	*	Kwadacha (Fort Ware Band) in Mackenzie	Chief Emil McCook (Dave Crompton and Emil McCook)	471-2302		First Nations		Mackenzie
SG Interview	*	Penticton Indian Band Development Corporation	Nathan Phillips			First Nations		Okanagan
SG/ Met March 5	*	Tahltan Nation	Norman Day and Glenda Ferris	235-3070		First Nations		Cassiar
SG	*	Wetsuwet'en First Nations, Moricetown	Andrew George	847-3630	847-5381	First Nations		Bulkley
Interview Feb. 22	*	CLMA	Gord Rattray	392-7778	392-4692	Forests	A	
Met Feb. 12th	*	Coastal Forest Products Association	Les Kiss			Forests	A	
Met Feb 12th	*	COFI	Brian Gilfillan			Forests	A	
Interview Feb. 21	*	ILMA	Peter Affleck	860-9663	860-0009	Forests	A	B.C.
Interview Feb. 22	*	Atco Lumber	Hans Louwe	367-9441	367-6210	Forests	P	Kootenays

Meeting/ Contact Records		Affiliation	Contact Person	Phone Number	Fax number	Sector	Type of Org.	Region
Interview Feb. 26	*	Canfor, Campbell River	Rob Woodside	281-2442	281-2485	Forests	P	Vancouver Island
Interview March 1	*	Canfor, Prince George	Walter Matosevic	962-3415	962-3566	Forests	P	Prince George
Sent fax Feb 20	*	Canfor, Vancouver	Ken Higginbotham	661-5241	661-5381	Forests	P	
Sent fax Feb 20	*	Cattermole Timber	Ted Holtby	856-0917	823-6541	Forests	P	Vancouver Island
Interview Feb 23	*	Coulson Forest Products	Paul Pashnick	723-8118	723-7766	Forests	P	Vancouver Island
Interview March 8	*	Husby Forest Products, Richmond	Bob Brasch	940-1234 ext. 3767	940-5940	Forests	P	QCI
Interview Feb. 22	*	Interfor	Gerry Fraser	689-6800	688-0313	Forests	P	VI, Coast, Sea-to-Sky
Sent fax Feb. 20		Interfor	Laura Wilimovsky		688-0313	Forests	P	
Interview Feb. 26	*	Kalesnikoff Lumber	Reiner Augustine	399-4211	399-4170	Forests	P	Kootenays
Interview Feb. 26		Lignum	David Peterson	392-3371	398-3977	Forests	P	Cariboo
Interview Feb. 23	*	Philpot Forestry Services Ltd.	Fred Philpot	635-6441		Forests	P	Northwest
Interview Feb 19	*	Riverside Forest Products, Kelowna	Don Couch	762-3411	861-6921	Forests	P	Okanagan
Interview Feb. 21	*	Tembec, Cranbrook	Dennis Rounsville	426-6241	426-7055	Forests	P	Kootenay
Interview March 13	*	TimberWest	Don McMullan	654-4596 654-4660	654-4662	Forests	P	Vancouver Island
Interview Feb. 21	*	Tolko, Vernon	Rick Sommer	672-9911	672-2289	Forests	P	Kamloops
Interview March 5	*	Truck Loggers' Association	Rick Jeffrey	684-4291	684-7134	Forests	P	B.C.
Sent fax Feb 20	*	Weldwood	Rod Beaumont, Chief Forester	687-7366	893-2980	Forests	P	Vancouver Island
Interview March 1	*	West Fraser	Gunter Weckerle	392-7784	392-7010	Forests	P	Cariboo
Sent fax Feb 20	*	Western Forest Products	Bill Dumont or Trevor Bonniface (Gold River)	665-6200	665-6268	Forests	P	Vancouver Island
Interview March 2	*	Weyerhaeuser	Bob Helfrich	828-7571	828-7565	Forests	P	Kamloops, Okanagan-Shuswap
Sent fax March 2	*	Weyerhaeuser	Stan Coleman	755-3523	755-3540	Forests	P	Vancouver Island
Met Feb 15	*	Ministry of Forests	Peter Fuglem, Manager Timber Supply	953-3836		Forests	PS	B.C.
Met Feb 15	*	Ministry of Forests	Melanie Boyce	953-4134	953-3838	Forests	PS	
Interview Feb. 6	*	Ministry of Forests, Kamloops	Gary Reay	371-6523		Forests	PS	Kamloops
Interview Feb. 19	*	LUCO	Warren Mitchell, Director	953-3473		Land Use	PS	B.C.
Interview Feb. 19	*	LUCO	John Bones	953-4745		Land Use	PS	B.C.

Appendix 8 – List of Contacts

Meeting/ Contact Records		Affiliation	Contact Person	Phone Number	Fax number	Sector	Type of Org.	Region
Met Feb. 26	*	BC Yukon Chamber of Mines (Vancouver)	Bruce McKnight	681-5328	681-2363	Mining	A	B.C.
Written comments	*	East Kootenay Chamber of Mines	Rick Walker			Mining	A	Kootenays
Met Feb 7	*	Mining Association of BC (Vancouver)	Gary Livingstone	681-4321	681-5303	Mining	A	B.C.
Interview Feb. 27	*	Canaccord Capital	Peter Brown	643-7044	643-7733	Mining	P	B.C.
Interview March 7	*	Cominco	Doug Horswill	682-0611	685-3019	Mining	P	
Met Feb 7		Consulting geologist	Gavin E. Dirom	987-3896	987-3896	Mining	P	B.C.
Interview March 7	*	Ecstall Mining Corp.	Chris Graf	681-4402	681-4402	Mining	P	Mackenzie
Interview March 5	*	Fording Coal, Elk Falls	Roger Berdusco	865-5675	865-5120	Mining	P	Kootenay
Interview March 5	*	Homestake Canada, Smithers	Vern Betts Gene Gulajec	895-4410 684-2345	684-9831	Mining	P	Bulkley
Sent fax Feb. 28		Imperial Metals	Pat McAndless	669-8959		Mining	P	B.C.
Sent fax Feb. 22	*	Investment/ Raises capital for juniors	John Brock	687-4951	687-4991	Mining	P	B.C.
Partial interview, March 6	*	Noranda, Toronto	Bill Mercer (ex-BC) & Robin Adair	416-982-7269	982-7420	Mining	P	B.C.
Interview March 5	*	Placer Dome Inc.	Rob Pease	371-3500 682-7082	682-7092	Mining	P	B.C.
Interview Feb. 26	*	Prospector	Dan Berkshire	923-2725	923-2765	Mining	P	Vancouver Island
Interview March 1	*	Teck	Russ Hallbauer	640-5272	640-5393	Mining	P	
Interview Feb. 23	*	Durfeld Geological Management Ltd.	Rudi Durfeld, Pres.	392-4691	392-3070	Mining	PS	Williams Lake
Met Feb 16	*	Ministry of Energy and Mines	Rolf Schmidth			Mining	PS	B.C.
Met Jan. 18th, 2001	*	Ministry of Energy and Mines	Graeme McLaren	952-0524		Mining	PS	B.C.
Interview Feb. 13th	*	BC Oil and Gas Commission	Richard Caesar (passed on from Tom Ouellette)	261-5790	261-5787	O & G	A	B.C.
Interview Feb. 13th	*	Canadian Association of Petroleum Producers (Calgary)	Geoff Morrison (passed on from David Luff)	267-1149	266-3214	O & G	A	B.C.
Sent fax Feb. 28	*	Canadian Hunter Exploration Ltd.	Craig Popoff	403-260-1139		O & G	P	Dawson Creek
Interview March 5	*	Canadian Natural Resources Ltd. (CNRL)	Bill Capperton	403-		O & G	P	
Interview March 12	*	Murphy Oil Company Ltd.	Margaret Ariss (passed on from Ed Johnson)	403-294-8987	294-8853	O & G	P	B.C.

Appendix 8 – List of Contacts

Meeting/ Contact Records		Affiliation	Contact Person	Phone Number	Fax number	Sector	Type of Org.	Region
Interview March 6	*	Petro-Canada	David Stuart	403-296-3562	296-5147	O & G	P	
Interview March 1	*	Outdoor Recreation Council of B.C.	Ray Pillman	737-3058 926-0077	737-3666 926-0207	Recreation	A	B.C.
Interview March 9	*	Cariboo-Chilcotin Association	Jennifer Case	392-2226		Tourism	A	Cariboo
Interview Feb. 16	*	Council of Tourism Association	Mary Mahon-Jones	685-5956	685-5915	Tourism	A	
Interview March 9	*	Guide Outiftter Association of BC	Dale Drown	278-2688	278-3440	Tourism	A	B.C.
Interview March 8	*	Tourism Action Society of the Kootenays, Revelstoke	Eileen Fletcher	837-9531		Tourism	A	Kootenays
Interview March 6	*	Canadian Mountain Holidays	Dave Butler	426-3599	426-3517	Tourism	P	Kootenays
Interview March 6	*	Chilcotin Holidays	Kevin Bracewell	238-2274	228-2274	Tourism	P	Lillooet
Interview March 3	*	Guide-Outfitter, Talkwa	Ray and Carrie Collingwood	846-9196	847-2909	Tourism	P	Cassiar
Interview March 7	*	Hills Guest Ranch, 100 Mile House	Pat Corbett	791-5225	791-6384	Tourism	P	Cariboo
Interview March 1	*	Nimmo Bay (Heli-fishing operator)	Craig Murray	956-4000	956-2000	Tourism	P	Central Coast
Interview March 2	*	Strathcona Park Lodge, Campbell River	Brian Gunn	286-3122	286-6010	Tourism	P	Vancouver Island
Met Feb 15th	*	BC Parks	Colin Campbell,	387-4357		Tourism	PS	
Met Feb 15	*	Ministry of Small Business, Tourism and Culture	Steven Connelly	356-1474	356-6555	Tourism	PS	
Sent fax	*	Ministry of Small Business, Tourism and Culture	Rob Gowan, Senior Resource Planner	387-6963		Tourism	PS	Okanagan, Lillooet

Notes:
SG: Stuart Gale
SL: Sylvie Lefebvre
Type of organization: A: Association; P: private and PS: Public Sector.

1. Includes only those who were contacted and received the interview survey questions. Most completed the detailed interviews, but a few were sent the information and decided to have others complete the interview. A few individuals were not able to participate in the given timeframe.
2. Many more individuals were contacted at the B.C. Ministry of Forests, BC Stats, the B.C. Ministry of Employment and Investment and other government agencies for data collection purposes.

Appendix 9 – Bibliography – Selected Reports

Assessment of the Kamloops Land and Resource Management Plan Recommendation, 1995.

B.C. Ministry of Forests, *Forest Range & Recreation Resource Analysis*, 1994.

Bulkley Valley Community Resources Board and the Bulkley Inter-Agency Planning Team, *Bulkley Land and Resource Management Plan, Volume One: Consensus Management Direction*, 1996.

Commission on Resources and Environment, *Cariboo-Chilcotin Land Use Plan*, July 1994.

Commission on Resources and Environment, *Cariboo-Chilcotin Land Use Plan Appendices*, 1994.

Commission on Resources and Environment, *East Kootenay Land Use Plan,* 1994. (also have draft of Volumes 1, 2 and 3)

Commission on Resources and Environment, *Vancouver Island Land Use Plan – Volume 1*, February 1994.

Commission on Resources and Environment, *West Kootenay Land Use Plan,* 1994.

Commission on Resources and Environment, *West Kootenay-Boundary and East Kootenay Land Use Plans, An Explanation of the Methodology Used to Complete the Impact Analysis*, January 1995.

Coopers & Lybrand Consulting, *Current and Future Economic Benefits of British Columbia Parks*, Report for the B.C. Ministry of Environment, Land and Parks, 1996.

Coopers & Lybrand Consulting, *Economic Benefits of British Columbia. Parks*, Report for the B.C. Ministry of Environment, Land and Parks, 1995.

G.E. Bridges & Associates Inc., *Kamloops LRMP Environmental, Economic and Social Profile*, 1993.

G.E. Bridges and Associates Inc., *Kamloops Land and Resource Management Plan Assessment of Management Plan Impacts*, 1995.

Holman, Gary and Eliot Terry of Keystone Wildlife Research in cooperation with the Ministry of Employment and Investment and Lakes Inter-Agency Planning Team, *Lakes District Land and Resource Management Plan, Preliminary Socio-Economic and Environmental Analysis of Draft Land Use Plan ("Scenario 0")*, 1997.

Holman, Gary and Eliot Terry of Keystone Wildlife Research, *Cassiar Iskut-Stikine Land and Resource Management Plan (LRMP) "Consensus Recommendations Package"*, 2000.

Appendix 9 – Bibliography – Selected Reports

Holman, Gary and Marvin Shaffer and Associates, E. Terry of Keystone Wildlife Research and J. Trask of Triton Environmental Consultants, *Mackenzie Land and Resource Management Plan – Socio-Economic & Environmental Assessment of the "Mackenzie Draft Recommended Land and Resource Management Plan"*, 2000.

Holman, Gary, *Socio-Economic Evaluation of Lower Mainland Protected Areas Proposed by Regional Public Advisory Committee*, 1996.

Holman, Gary, *Socio-Economic Impact Assessment of Recommended Robson Valley Land Use Plan*, 12 page fax, November 7, 1996.

Land Use Coordination Office, Thompson-Okanagan Inter-Agency management Committee, *Kamloops Land and Resource Management Plan Monitoring Report*, 1999.

Marvin Shaffer & Associates Ltd. (Gary Holman and Karen Cooke), *Kispiox Resource Management Plan Socio-Economic Assessment*, 1992.

Ministry of Employment and Investment (with help from Gary Holman and Jim Trask of ECL Envirowest Environmental Consultants), *Prince George Land and Resource Management Plan Reference Document - 8.5 – Socio-Economic and Environmental Assessment*, 1998.

Ministry of Employment and Investment (with help from Gary Holman and Jim Trask of ECL Envirowest Environmental Consultants), *Recommended Fort St. James Land and Resource Management Plan – Socio-Economic and Environmental Assessment*, 1998.

Ministry of Employment and Investment (with help from Gary Holman and Jim Trask of ECL Envirowest Environmental Consultants), *Recommended Vanderhoof Land and Resource Management Plan – Appendix: Socio-Economic and Environmental Evaluation of the Vanderhoof LRMP*, no date.

Ministry of Employment and Investment, E.Terry of Keystone Wildlife Research, Robinson Consulting Associates Ltd. and J. Paul & Associates, *Fort Nelson LRMP – Socio-Economic & Environmental Assessment of Recommended Land & Resource Management Plan*, prepared for the Fort Nelson LRMP table, 1997.

Ministry of Employment and Investment, E.Terry of Keystone Wildlife Research, Robinson Consulting Associates Ltd. and J. Paul & Associates, *Dawson Creek Land & Resource Management Plan – Socio-Economic & Environmental Assessment*, 1999.

Ministry of Employment and Investment, E.Terry of Keystone Wildlife Research, Robinson Consulting Associates Ltd. and J. Paul & Associates, *Fort St. John Land & Resource Management Plan – Section 5.0 - Socio-Economic & Environmental Assessment Summary*, April 1997, 9 pages.

Province of B.C., *A Protected Areas Strategy for British Columbia*, 1993.

Wouters, Garry, Jobs and Timber Accord Advocate, *Forest Policy Review*, March 2000.

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Main region of operation (only one)								
Vancouver Island	3	1	0	1	1			6
Lower Mainland/VFR	1	0	0	1	1			3
Central Coast/QCI	2	0	0	1	0			3
Kamloops/Okanagan	4	0	0	0	2	1		7
Cariboo	3	1	0	2	0			6
Prince George FR	1	1	0	0	0			2
Kootenays	3	2	0	2	1			8
North Coast/ Northwest	1	1	0	1	2	3		8
Northeast	0	0	5	0	2	1		8
All of B.C.	2	6	0	5	6		6	25
Total responses	20	12	5	13	15	5	6	76
Number of employees	19,710	6,865	80	506				27,161
Number of employees & contractors			300					300
Involvement in SLUPs								
Have you been involved?	15	5	0	11	10	5	5	51
As a member of table	13	5	0	8	6	3	2	37
Other	0	0	0	2	4	2	3	11
Implementation	9	2	0	3	6	2	6	28
More than one SLUPs	10	2	0	5	6			23
Regions where involved in SLUPs (can specify more than one region)								
Organization covers all of BC	1	0	0	2	5		6	14
Vancouver Island	7	2	0	2	1			12
Central Coast/ QCI	3	0	0	3	1			7
Mainland/ Southwest	2	1	0	2	1			6
Thompson/ Okanagan	4	0	0	1	2	1		8
Kootenay	4	1	0	3	0			8
Cariboo	4	1	0	4	0			9
North Coast/ Northwest	1	1	0	3	2	3		10
Omineca Peace	1	1	0	1	0			3
Northeast	0	1	0	0	2	1		4
Effect on investment:								
Better	3	0	0	3	3			9
Stayed about the same	9	0	3	4	4			20
Worse	7	12	2	4	5			30
Total responses	19	12	5	11	12			59
Effect on timing of projects:								
Better	0	0	0	0	0			0
Stayed about the same	4	0	0	2	0			6
Worse	2	0	5	1	0			8

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Total responses	6	0	5	3	0			14
Effect on land use certainty								
Increased greatly	3	0	0	4	3	2	5	17
Increased moderately	1	0	1	0	0	1	1	4
Slightly increased	8	1	3	3	8	1		24
Stayed about the same	5	1	1	4	3	1		15
Decreased slightly	1	0	0	1	0			2
Decreased greatly	2	10	0	1	0			13
Total responses	20	12	5	13	14	5	6	75
Will certainty increase investments?								
Yes	5	1	2	5	4	2		19
No	2	0	1	0	0	3		6
Total responses	7	1	3	5	4	5		25
Increase in costs:								
More than 10%	7	2	2	0	2			13
5% to 10%	1	0	0	0	0			1
1 to 5%	4	0	0	0	2			6
Less than 1%	3	0	0	0	0			3
No impact	1	2	0	9	2			14
Increased - don't know %	4	5	3	0	7			19
Total responses	20	9	5	9	13			56
Communication with governments:								
Much better	5	0	1	6	6	3		21
Better	2	0	0	2	0	2		6
Slightly better	8	1	2	2	5			18
Remained about the same	4	6	2	1	3			16
Slightly worse	0	0	0	1	0			1
Much worse	1	2	0	0	0			3
Total responses	20	9	5	12	14	5		65
Communication with stakeholders								
Much better	4	0	1	5	6	3		19
Better	2	0	0	2	0	2		6
Slightly better	10	1	2	3	5			21
Remained about the same	4	6	1	1	3			15
Slightly worse	0	0	0	1	0			1
Much worse	0	2	0	1	0			3
Total responses	20	9	4	13	14	5		65
Communication with First Nations								
Much better	0	0	0	1	3			4
Better	0	0	0	1	0			1
Slightly better	3	0	1	2	3			9

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Remained about the same	16	8	2	6	8			40
Slightly worse	0	0	0	1	0			1
Much worse	0	0	0	0	0			0
Total responses	19	8	3	11	14			55
Communication among agencies:								
Much better	7	0	0	4	7			18
Better	1	0	0	0	1			2
Slightly better	7	1	1	5	3			17
Remained about the same	2	4	3	2	3			14
Slightly worse	1	1	0	0	0			2
Much worse	1	3	0	2	0			6
Total responses	19	9	4	13	14			59
Increased cooperation & efficiencies?								
Much better	4	0	0	2	3			9
Better	1	0	0	0	2			3
Slightly better	6	0	2	5	4			17
Remained about the same	4	2	0	3	3			12
Slightly worse	2	2	0	0	0			4
Much worse	1	2	0	2	0			5
Total responses	18	6	2	12	12			50
Conflicts with environmental groups:								
Decreased greatly	3	0	1	2	4			10
Decreased moderately	1	0	0	0	1			2
Decreased slightly	8	1	2	3	6			20
Stayed about the same	7	6	1	5	1			20
Increased slightly	1	2	0	2	0			5
Increased greatly	0	2	0	1	0			3
Total responses	20	11	4	13	12			60
Conflicts with recreation:								
Decreased greatly	3	0	0	3	3			9
Decreased moderately	2	0	0	0	0			2
Decreased slightly	4	0	4	1	5			14
Stayed about the same	10	7	1	3	4			25
Increased slightly	0	1	0	1	0			2
Increased greatly	0	2	0	0	0			2
Total responses	19	10	5	8	12			54
Conflicts with tourism:								
Decreased greatly	3	0	0	2	2			7
Decreased moderately	2	0	0	0	0			2
Decreased slightly	4	0	3	0	6			13
Stayed about the same	9	7	1	0	4			21

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Increased slightly	0	1	0	0	0			1
Increased greatly	0	2	0	0	0			2
Total responses	18	10	4	2	12			46
Conflicts with First Nations:								
Decreased greatly	0	0	0	1	0			1
Decreased slightly	0	0	2	1	5			8
Stayed about the same	18	9	1	10	7			45
Increased slightly	0	0	0	1	0			1
Increased greatly	0	0	0	0	0			0
Total responses	18	9	3	13	12			55
Conflicts with forest industry:								
Decreased greatly	0	0	0	4	4			8
Decreased slightly	0	0	0	3	6	1		10
Stayed about the same	0	0	0	4	3	4		11
Increased slightly	0	0	0	1	0			1
Increased greatly	0	1	0	1	0			2
Total responses	0	1	0	13	13			27
Conflicts with other industry:								
Decreased greatly	0	0	0	0	0			0
Decreased slightly	0	0	0	0	2			2
Stayed about the same	0	0	0	0	1			1
Increased slightly	0	0	0	0	0			0
Increased greatly	0	0	0	0	0			0
Total responses	0	0	0	0	3			3
Industry developed differently?								
Yes	15	10	3	7	8	4		47
No	2	0	1	5	4	1		13
Resource inventories are:								
Much better	3	0	0	5	4		6	18
Better	10	0	0	5	9	4		28
Stayed about the same	7	9	3	2	1	1		23
Are worse	0	1	0	0	0			1
Are much worse	0	0	0	0	0			0
Total responses	20	10	3	12	14	5	6	70
Resource use information is:								
Much better	5	0	0	5	4			14
Better	12	0	0	5	6			23
Stayed about the same	2	6	2	2	1			13
Worse	0	1	0	0	0			1
Much worse	0	0	0	0	0			0
Total responses	19	7	2	12	11			51

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Invest anywhere else?								
Yes	0	9	5	0	0			14
No	0	1	0	4	1			6
Total responses	0	10	5	4	1			20
If yes, where?								
Alberta	0	2	5	0	0			7
Saskatchewan/ Manitoba	0	2	0	0	0			2
Yukon	0	2	0	0	0			2
NWT/ Nunavut	0	2	1	0	0			3
Ontario	0	1	0	0	0			1
Quebec	0	2	0	0	0			2
Atlantic Canada	0	0	0	0	0			0
Alaska	0	0	0	0	0			0
Other	0	1	0	0	0			1
Is land use regime better outside BC:								
Yes	2	8	1	3	1			15
No	2	1	1	0	0			4
Depends on region	0	3	1	0	0			4
Total responses	4	9	2	3	1			19

Forest Only Questions

Effect of PAs on THLB	0
Definitely increase	0
Probably increase	1
Stay about the same	4
Probably decrease	2
Definitely decrease	13
Total responses	20
Effect of PAs on current AAC	0
Definitely increase	0
Probably increase	1
Stay about the same	5
Probably decrease	2
Definitely decrease	12
Total responses	20
Effect of SMZs on THLB	0
Definitely increase	0
Probably increase	2
Stay about the same	4
Probably decrease	3
Definitely decrease	11

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Total responses	20							
Effect of SMZs on current AAC	0							
Definitely increase	0							
Probably increase	2							
Stay about the same	5							
Probably decrease	3							
Definitely decrease	10							
Total responses	20							
Have SLUPs imposed constraints?	0							
Yes	16							
No	1							
Total responses	17							
Effect on approval of FD Plans	0							
Leads to delays	6							
Quickens the process	5							
Has no impacts	3							
Depends on area	3							
Total responses	17							
Have SLUPs helped certification?	0							
Yes	8							
No	6							
Total responses	14							
Will SLUPs help certification?	0							
Yes	12							
No	5							
Total responses	17							
Has no SLUPs hindered certification?	0							
Yes	2							
No	4							
Have not tried certification	4							
Total responses	10							
Fewer conflicts with SLUPs?	0							
Yes	7							
No	5							
Total responses	12							

Mining Only Questions

Company affected by PAs?		
Yes		7
No		4
Total responses		11

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Exploration affected by SMZs?								
Yes		7						
No		4						
Total responses		11						
Move away from SMZs?								
Yes		9						
No		2						
Total responses		11						
Move where?								
Other areas within B.C.		1						
Other jurisdictions		8						
Not affected by SMZs		0						
Total responses		9						
Operate in MK area?								
Yes		3						
No		6						
Total responses		9						
PAs negatively affected new mines?								
Strongly agree		8						
Mildly agree		1						
Mildly disagree		0						
Strongly disagree		0						
Total responses		9						
SMZs negatively affected new mines?								
Strongly agree		9						
Mildly agree		0						
Mildly disagree		0						
Strongly disagree		0						
Total responses		9						
% drop attributed to SLUPs & PAs								
Almost entirely		6						
More than half		1						
> 10%, less than 50%		4						
Minor factor (less than 10%)		0						
Total responses		11						
% drop attributed to lack of discoveries								
Almost entirely		0						
More than half		0						
> 10%, less than 50%		2						
Minor factor (less than 10%)		2						
Total responses		4						

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
% drop attributed to taxes and costs								
Almost entirely		0						
More than half		0						
> 10%, less than 50%		3						
Minor factor (less than 10%)		6						
Total responses		9						
Long term negative impact on BC?								
Yes		10						
No		0						
Total responses		10						
PAs will return confidence?								
Strongly agree		2						
Mildly agree		4						
Mildly disagree		0						
Strongly disagree		5						
Total responses		11						
Different decision re. PAs?								
Yes		3						
No		7						
Total responses		10						
Grand-fathered Windy Craggy?								
Yes		4						
No		4						
Total responses		8						
Windy Craggy receives EAP?								
Yes		4						
No		3						
Total responses		7						
Hinders process in SMZs								
Yes		6						
No		0						
Total responses		6						
Hinders outside SMZs and PAs								
Yes		3						
No		4						
Total responses		7						

Oil and Gas Only Questions

Company affected by PAs?			
Yes			0

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
No			3					
Total responses			3					
Exploration affected by SMZs?								
Yes			4					
No			1					
Total responses			5					
Move away from SMZs?								
Yes			4					
No			1					
Total responses			5					
Move where?								
Other areas within B.C.			2					
Other jurisdictions			2					
Not affected by SMZs			1					
Total responses			5					
Return when pre-tenure plans done?								
Yes			3					
No			0					
Total responses			3					
Operate in MK region?								
Yes			2					
No			1					
Total responses			3					
PAs negatively affected O & G?								
Strongly agree			0					
Mildly agree			1					
Mildly disagree			1					
Disagree			3					
Strongly disagree								
Total responses			5					
SMZs negatively affected O & G?								
Strongly agree			1					
Mildly agree			1					
Mildly disagree			1					
Disagree			2					
Strongly disagree			0					
Total responses			5					
SMZs will negatively affect O & G?								
Strongly agree			3					
Mildly agree			0					
Mildly disagree			0					

Appendix 10 - Interview Results

(Interviews with First Nations and Environmental representatives focused on the SLUP impacts on those values)

	Forestry	Mining	Oil and Gas	Tourism/ Rec	Other	First Nations	Environment	TOTAL
Disagree			1					
Strongly disagree			1					
Total responses			5					
SLUPs change likeliness of O & G additions?								
Very likely			2					
Somewhat likely			1					
Somewhat unlikely			2					
Very unlikely			0					
Total responses			5					
Mitigate through directional drilling?								
Very limited			0					
Somewhat limited			1					
May be some potential			4					
Most can be mitigated			0					
Total responses			5					

Tourism Only Questions

New parks increase visits your region?				
Yes				2
No				11
Total responses				13
New parks increase visits elsewhere?				
Yes				2
No				10
Total responses				12
More recreation tenures?				
Yes				3
No				10
Total responses				13
Increase dollar value of tenures?				
Yes				5
No				7
Total responses				12
PAs hindered tourism development?				
Yes				8
No				4
Total responses				12

Appendix 11 – Protected Areas in British Columbia by Ecosection - 1999

Ecoprovince	Ecosection	Protected (thousands of hectares)	Not Protected (thousands of hectares)	Grand Total (thousands of hectares)	% Protected
Boreal Plains	Clear Hills	9	1207	1216	0.7%
Boreal Plains	Halfway Plateau	1	1003	1004	0.1%
Boreal Plains	Kiskatinaw Plateau	21	790	811	2.6%
Boreal Plains	Peace Lowland	23	895	919	2.5%
Central Interior	Bulkley Basin	39	1471	1510	2.6%
Central Interior	Bulkley Ranges	0	276	276	0.0%
Central Interior	Cariboo Basin	11	941	951	1.1%
Central Interior	Cariboo Plateau	5	710	715	0.7%
Central Interior	Central Chilcotin Ranges	291	565	856	34.0%
Central Interior	Chilcotin Plateau	62	1491	1553	4.0%
Central Interior	Fraser River Basin	33	205	237	13.8%
Central Interior	Nazko Upland	221	1801	2022	10.9%
Central Interior	Nechako Upland	523	490	1012	51.6%
Central Interior	Western Chilcotin Ranges	108	251	359	30.1%
Central Interior	Western Chilcotin Upland	235	761	997	23.6%
Coast & Mountains	Alaska Panhandle Mountains	2	470	472	0.4%
Coast & Mountains	Alsek Ranges	181	88	268	67.3%
Coast & Mountains	Boundary Ranges	55	1953	2008	2.7%
Coast & Mountains	Eastern Pacific Ranges	269	1152	1421	18.9%
Coast & Mountains	Hecate Lowland	62	1463	1525	4.0%
Coast & Mountains	Kitimat Ranges	637	2866	3503	18.2%
Coast & Mountains	Nahwitti Lowland	19	234	253	7.6%
Coast & Mountains	Nass Basin	39	586	625	6.2%
Coast & Mountains	Nass Ranges	54	1237	1291	4.2%
Coast & Mountains	Northern Island Mountains	53	525	578	9.2%
Coast & Mountains	Northern Pacific Ranges	70	3071	3141	2.2%
Coast & Mountains	Northwestern Cascade Ranges	5	40	44	10.3%
Coast & Mountains	Outer Fiordland	15	422	437	3.4%
Coast & Mountains	Queen Charlotte Lowlands	70	257	327	21.3%
Coast & Mountains	Queen Charlotte Strait	1	22	23	3.5%
Coast & Mountains	Skidegate Plateau	39	293	332	11.9%
Coast & Mountains	Southern Pacific Ranges	175	891	1066	16.4%
Coast & Mountains	Windward Island Mountains	204	963	1167	17.4%
Coast & Mountains	Windward Queen Charlotte Mountains	117	230	347	33.8%
Georgia Depression	Fraser Lowland	5	318	322	1.5%
Georgia Depression	Georgia Lowland	10	114	124	8.2%
Georgia Depression	Leeward Island Mountains	149	781	930	16.0%
Georgia Depression	Naniamo Lowland	5	344	349	1.4%
Georgia Depression	Strait of Georgia	3	53	56	5.9%

Prepared by the Ministry of Sustainable Resource Management

Ecoprovince	Ecosection	Protected (thousands of hectares)	Not Protected (thousands of hectares)	Grand Total (thousands of hectares)	% Protected
Northern Boreal Mountains	Cassiar Ranges	33	2980	3013	1.1%
Northern Boreal Mountains	Eastern Muskwa Ranges	601	1131	1731	34.7%
Northern Boreal Mountains	Hyland Highland	33	460	493	6.7%
Northern Boreal Mountains	Icefield Ranges	535	0	535	100.0%
Northern Boreal Mountains	Kechika Mountains	67	1004	1071	6.2%
Northern Boreal Mountains	Liard Plain	8	1317	1325	0.6%
Northern Boreal Mountains	Muskwa Foothills	336	745	1081	31.1%
Northern Boreal Mountains	Southern Boreal Plateau	1111	1472	2583	43.0%
Northern Boreal Mountains	Stikine Plateau	118	1695	1813	6.5%
Northern Boreal Mountains	Tagish Highland	93	349	442	21.0%
Northern Boreal Mountains	Tahltan Highland	15	902	917	1.6%
Northern Boreal Mountains	Tatshenshini Basin	229	101	330	69.5%
Northern Boreal Mountains	Telsin Plateau	100	1481	1581	6.3%
Northern Boreal Mountains	Tuya Range	0	1128	1128	0.0%
Northern Boreal Mountains	Western Muskwa Ranges	86	850	936	9.2%
Southern Interior	Leeward Pacific Basin	146	426	572	25.5%
Southern Interior	Northern Okanagan Basin	9	238	247	3.6%
Southern Interior	Northern Okanagan Highland	12	810	822	1.4%
Southern Interior	Northern Thompson Upland	50	925	975	5.1%
Southern Interior	Okanagan Range	48	210	258	18.6%
Southern Interior	Pavillion Ranges	38	400	438	8.6%
Southern Interior	Southern Chilcotin Ranges	44	535	578	7.5%
Southern Interior	Southern Okanagan Basin	.24	79	79	0.3%
Southern Interior	Southern Okanagan Highland	.06	55	55	0.1%
Southern Interior	Southern Thompson Upland	14	1504	1518	0.9%
Southern Interior	Thompson Basin	22	269	291	7.5%
Southern Interior Mountains	Big Bend Trench	1	117	118	0.9%
Southern Interior Mountains	Border Ranges	22	506	528	4.2%
Southern Interior Mountains	Bowron Valley	20	606	626	3.2%
Southern Interior Mountains	Central Columbia Mountains	286	1317	1603	17.8%
Southern Interior Mountains	Central Park Ranges	70	462	532	13.2%
Southern Interior Mountains	Crown of the Continent	11	49	59	18.1%
Southern Interior Mountains	East Kootenay Trench	3	451	454	0.7%
Southern Interior Mountains	Eastern Purcell Mountains	117	513	629	18.5%
Southern Interior Mountains	Front Ranges	81	119	200	40.4%
Southern Interior Mountains	McGillivray Range	3	230	233	1.3%
Southern Interior Mountains	Northern Columbia Mountains	686	2328	3014	22.8%
Southern Interior Mountains	Northern Park Ranges	232	491	723	32.1%
Southern Interior Mountains	Quensel Highland	97	697	794	12.3%

Appendix 11 – Protected Areas in British Columbia by Ecosection - 1999

Ecoprovince	Ecosection	Protected (thousands of hectares)	Not Protected (thousands of hectares)	Grand Total (thousands of hectares)	% Protected
Southern Interior Mountains	Selkirk Foothills	86	685	771	11.2%
Southern Interior Mountains	Shuswap Highland	218	1159	1377	15.8%
Southern Interior Mountains	Southern Columbia Mountains	42	614	656	6.4%
Southern Interior Mountains	Southern Park Ranges	343	762	1106	31.0%
Southern Interior Mountains	Upper Fraser Trench	18	230	248	7.3%
Sub-boreal Interior	Babine Uplands	74	1977	2051	3.6%
Sub-boreal Interior	Eastern Skeena Mountains	84	862	946	8.9%
Sub-boreal Interior	Hart Foothills	38	757	795	4.8%
Sub-boreal Interior	Hart Ranges	209	1244	1453	14.4%
Sub-boreal Interior	Manson Plateau	45	1050	1095	4.1%
Sub-boreal Interior	McGregor Plateau	4	656	659	0.5%
Sub-boreal Interior	Misinchinka Ranges	65	703	768	8.4%
Sub-boreal Interior	Nechako Lowland	73	1900	1973	3.7%
Sub-boreal Interior	Northern Skeena Mountains	37	1642	1679	2.2%
Sub-boreal Interior	Parsnip Trench	.4	400	400	0.1%
Sub-boreal Interior	Peace Foothills	43	623	666	6.5%
Sub-boreal Interior	Southern Omineca Mountains	7	1045	1052	0.7%
Sub-boreal Interior	Southern Skeena Mountains	34	630	664	5.1%
Taiga Plains	Etsho Plateau	29	1287	1315	2.2%
Taiga Plains	Fort Nelson Lowlands	12	2433	2445	0.5%
Taiga Plains	Muskwa Plateau	86	2462	2548	3.4%
Taiga Plains	Petitot Plain	20	642	662	3.0%
Pacific Shelf and Mountains - MARINE	Continental Slope	153	3177	3330	4.6%
Pacific Shelf and Mountains - MARINE	Dixon Entrance	1	1088	1089	0.1%
Pacific Shelf and Mountains - MARINE	Hecate Strait	125	1155	1280	9.8%
Pacific Shelf and Mountains - MARINE	Johnstone Strait	9	243	252	3.7%
Pacific Shelf and Mountains - MARINE	North Coast Fjords	30	931	961	3.1%
Pacific Shelf and Mountains - MARINE	Queen Charlotte Sound	113	3526	3639	3.1%
Pacific Shelf and Mountains - MARINE	Queen Charlotte Strait	8	222	230	3.3%
Pacific Shelf and Mountains - MARINE	Vancouver Island Shelf	90	1580	1670	5.4%
Georgia Puget Basin-MARINE	Juan de Fuca Strait	2	148	150	1.4%
Georgia Puget Basin-MARINE	Strait of Georgia	9	782	791	1.1%
Northeast Pacific-MARINE	Subarctic Pacific	0	17098	17098	0.0%
Northeast Pacific-MARINE	Transitional Pacific	0	14850	14850	0.0%

Note: Numbers may not add across rows due to decimal point rounding.